The In-Supporting Content of the Extended Mind

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Abstract

The thesis of the extended mind has been upheld for a decade and defended seriously (Clark 1995, 1997ab, 1999ab, 2001ab, 2001ab, 2002, 2003; Clark and Chalmers 1998; Dennett 1996, 1998, 2000; Millikan 1995). However, there seems to have been little attention addressed to the sense in which the extended mind can have content, and the role of internal mentality standing in the unfolding of the extended mind seems to have been underestimated. Dennett regards the mind as consisting of internalized *tools*. Clark claims that the (internal) mind is non-privileged compared to the external resources of the extended mind. The present paper provides a different perspective: the extended mind indeed has an inner core that has a distinctive role in the extended mind's course of unfolding, to wit, to maintain a novel sense of content–the *in-supporting content*—as smoothly and flexibly as possible. Such content is conceived of as ways of organizing activities: when the extended mind unfolds, it remains holding an inner core that constantly serves to *organize* internal mental resources (including internalized resources) *in support of* the agent's problem-solving performance in the environment and/or cultural settings. The existence of that distinctive role, this paper argues, certifies that the extended mind has an inner core that is reasonably privileged compared to external resources.

Keywords: user; content; extended mind; skill; tool.

Introduction

A 'tenet' in the study of embodied mind is that cognition is not a central unit for processing information in the abstract; conversely, cognition is conceived of as intrinsically connecting to body, environment and culture (Clark 1997ab, 2001a, 2002, 2003; Dennett 1996, 1998, 2000), thus forming the *extended mind* (Clark 2003; Clark and Chalmers 1998). The thesis of extended mind—proposing that mind is extended—is grounded on the following three points together: 1. the completion of cognitive tasks is usually aided by manipulation of instruments, such as pen and notepad, books, an abacus, nautical slide rule (Hutchins 1995), language and diagrams; 2. manipulation of instruments brings substantive aid to mental processes that makes the completion of cognitive tasks easier; 3. concerning the nature of that manipulation, *were* it done in the brain it would be recognized outright as a part of cognitive process (Clark and Chalmers 1998). The above-mentioned instruments serve to provide new storage of representations or new forms of representation. The point 3 indicates that the mind is internal in the first place. The above can be called *weak* thesis of extended mind, compared to the *strong* thesis of extended mind stated below. Dennett's (1996, 1998, 2000) raises the notion of *mind-tools*, which regards the mind as fundamentally consisting of skills (i.e. *knowing-how*) that manipulate tools. Here, the term "tools" broadly refers to physical tools, language, and even cultural "products" such as rules of reasoning. Human mind is constituted of such skills, which are seen as internalized tools—named to be "mind-tools". Clark (2003) introduces the idea that humans are basically *natural-born cyborgs*, by considering the mind to be an evolutionary product of manipulating technologies for scaffolding and empowering our thought *and action*; the brain has been shaped in the course of evolution as a device for manipulating technologies. Clark's term of "technologies" and Dennett's term of "tools" have roughly the same coverage. Dennett (1996, 1998, 2000) boldly claims that except for mind-*tools* there is nothing left in the mind. Despite granting a bundle of *know-how* to *manage* tools, he considers all mind-tools as userless. In addition, Clark considers that in the *smooth* use of technologies the position of self or internal mind is very thin; in fact, he regards the internal mind as non-privileged compared to external resources. The present paper, in order to challenge them but respect the general idea of extended mind, raises an caveat: even in *smooth* use of technologies there is indeed a compelling role of internal mentality preserved in the unfolding of the extended mind—a role that is not simply the presence of tools or skills—as manifested in the maintenance of in-supporting content.

Discussions of the extended mind have touched the issue of content, as seen in the notions of *control-based contents* and *action-oriented contents* alike (Clark 1995, 1999ab, 2001ab), but such discussions as yet are mostly limited to the faculty of motor control. Beyond that, however, an account of content is still required. This is because the use of cultural devices, such as physical tools, technologies, calculating methods and reasoning rules, indeed needs training and mental control to various degree. Proficient users can have conscious states to handle such devices smoothly and flexibly. This makes it convincing to see those users' controlling states as bearing content, in the sense of management concerning ways of performance. Hinted by such a novel sense of content, certain questions concerning content of the extended mind would naturally arise: in what sense can the states of extended mind hold content, and ultimately what *are* those states? It is intuitive to think that humans have mental states, but it would not be equally intuitive to consider them so in the context of the *extended* mind. When considering internal mental states, it is straightforward to talk about their content, but it seems

not straightforward at all to think of the content held by the *extended* mind. This is true especially because the philosophy of mind traditionally conceives of the content of mental states as serving to *describe* states of the external world; by contrast, the extended mind, is alternatively considered as mainly working for *problem-solving*.

A difficulty in holding a sense of content for the extended mind is that the extended mind is basically distributed, across the boundary of human skin-bags, into the environment and culture. A dilemma arises, then. The mental states of an agent, because of the *extended* mind, go far beyond the boundary of an animate agent; consequently, the mental states as a whole are extending, hence not internal. From another point of view, it is hard to think of an agent's *mental* states as going beyond the skin-and-skull, as the mind seems to have been taken as something intrinsically internal. The agent indeed has mental states that are entirely internal, although they can manage information coming in from the external. Thus, the mental states of a human agent are *both* internal to himself/herself *and* going beyond the boundary of the skin-bag. Whether the extended part of the mind is something mental becomes uncertain. The term "extended mind", hence, seems to include an inner conflict.

To make discussion clear, the present paper analyses, on the one hand, that the mind has an *internal* side in the sense that in contrast to external resources it takes place internally, and on the other hand, that mind is extended in consideration of its intrinsic interactions with external resources. External resources can be internalized as parts of *mental* resources, while some other mental resources—such as attention and memory for maintaining learning—are intrinsically internal. It is because cognition consists of making use of external resources that the mind is bound to extend beyond the skin-and-skull boundary. Although they are used and accordingly are internalized as certain mind-tools, the external resources being used remain *objects* of organizing activity. Although the mind is extended, the external resources would not consequently become parts of the organizing *subject*. This is a subject in a phenomenological sense; there is neither metaphysic ground nor supernatural being conferred at this point.

On the basis of the above understandings, the role of organizing activity in the use of mental resources, this paper argues, warrants the existence of an inner core in the extended mind. As a reason, it should be noted that the maintenance of such a role is not tantamount to mere presence of mind-*tools* or skills for managing external resources. The activity of organizing mental resources requires achieving mental unity; the extended mind must have an inner core in which mind-tools and skills are to be fine-tuned in order to gain a sense of coherence, apart from their being present internally. As understood above, the inner core of the extended mind is not the internal mind in the traditional sense. The present argues that the extended mind should have a compelling inner core. It is an organizing role for using internalized mind-tools in the light of gaining a mental unity, rather than an internal database.

The present paper raises a novel account of content—the *in-supporting content*—in which content is conceived of as ways of organizing activities: when the extended mind unfolds, it remains holding an inner core that constantly serves to *organize* (internal) mental resources—including mind-tools—mediated by her brain and body, *in support of* the agent's problem-solving (including bodily control) performance in the environment and/or cultural settings. The mind, the present paper aims to show, indeed has an inner core manifested in the unfolding of the extended mind. It is, to wit, the role of maintaining the in-supporting content as smoothly and flexibly as possible. The existence of that role certifies the somewhat privileged status of an inner core existing in the unfolding of the extended mind.

Userless Mind-Tools

Dennett (1996, 1998, 2000) presents a skill-based vision of mind with four points. Firstly, he considers the mind as made of *mind-tools*—tools for thinking—such as notations, slide-rules, abacuses, education, norms and laws. They are tools because they serve to make life easier. Tools are external resources, but they can be internalized for use, as aforementioned, thus transformed into *mind*-tools. Less sophisticatedly, even a can-opener or a rake is a mind-tool, as when *using* a can-opener an agent has in her mind a way of opening a can and a rake should be seen as a "mechanized sorting algorithm" (Dennett's phrase, in Clapin 2002: 95). Secondly, all explicit representations have content in virtue of the agents' skills, or tacit knowledge, of managing tools. Content, hence, is basically skill-based. Because all mind-tools are managed with the know-how of skills, content consists of mind-tools. Thirdly, although a tool has its user, Dennett thinks quite startlingly that the cognitive agents need not. The mind-tools are deemed as userless. Beyond equipment there is nothing left in the mind. Lastly, Dennett claims that what makes humans distinctive is the making of *florid representating*, where the higher-level representations serve as meta-representation and re-organization of lower level ones, with the result of providing *witting* representations, such as language and the rules of reasoning.

Clark (2002) appreciates Dennett's above notion of cognitive agent and explains in favor of him by adopting Preston's (1998) notion of a tool. Preston (1998) follows Heidegger's notion of equipment, a notion without imposing an internal-external distinction on the user-tool relation. That notion appears to be highly applicable to everything being used because bodily parts (e.g. hands) and even biological cognitive elements (including mental states) can be conceived of as equipment (of cognitive faculty) such as rakes and shopping lists. Thus, the handling of equipment turns up even in *internal* devices. Beyond equipment there is nothing left in cognitive faculty. As a consequence, the need to have a user as an equipment-controller disappears in a well-weaved collection of equipment.

Despite Dennett's claim of userless mind-tools, it is worth noting that the well-weaved collection of equipment seems to constitute something that is both mental and internal. This appears to be the underlying machinery of tool-use in the guise of weaved connections, and consequently seems to be a vestige of user left in the extended mind. Hence, the role of an inner core in the extended mind, as manifested in the role of the disguised user, does not vanish.

The Human-Environment-Culture Merger

Clark's idea of the extended mind is clear and simple: through their evolutionary and cultural history, humans have learnt to merge seamlessly with cultural devices such as technologies, and the merging results have been carved in the brain by courtesy of the significant degree of cortical plasticity. The brain, body and external resources (such as pencil, papers, previous marginalia made on papers or books, electric files, cell phone, computer, internet) *together*, set up a *biotechnological matrix* that constitutes a problem-solving machine. On account of such biotechnological matrixes humans can be regarded as (natural-born) cyborgs, and consequently humans can be identified as such problem-solving machines. A talent of the human brain is to learn to join as a player of problem-solving team.

Clark's thesis of brain-technologies merger, as it seems, does not reserve a position for an inner core of the mind. One may attempt to argue for the existence of the "real me" which excludes all nonconscious neural activities interacting with external resources. However, Clark thinks, "the vision of the mind and self" in this "cognitive amputation" "is thin indeed!" (Clark 2003, p. 30).

An argument supporting the claim that the inner core is non-privileged in extended mind is that technologies have become *integral* to human life. The deprival of them would make people (their users) disoriented or even seemingly handicapped. However, such an argument, the present paper contends, simply certifies the human need of technologies and tools. It does not automatically lead to the claim that among the components of the extended mind nothing is privileged in its internal side.

In modern life, the mind surely is not *dominant* in the sense of commanding and holding exclusive instructing guidance. Yet, it need not be privileged in such a strong sense, but can alternatively be more humble, namely, privileged in the sense of flexible control and learning. For the extended mind, its internal side unbeatably holds the main position of control and learning, and nothing external (to the brain, hence including the body) can take its place. Hence, the internal side of the extended mind remains privileged even in the *bio-environmental-cultural* matrix, that is, privileged in the matrix consisting of the body, environmental factors, and cultural ideas and devices.

In-Supporting Content

This section presents the account of in-supporting content, in order to explain the role of an inner core standing in the unfolding of the extended mind, as shown below. When the extended mind unfolds, an inner core serves to *organize* (internal) mental resources—surely, including mind-tools—*in support of* the agent's problem-solving performance in the environment and/or cultural settings. The activity of organizing those mental resources is maintained with the aim of making the brain working smoothly and efficiently to exploit external resources for the *need* of the required problem-solving performance. The organization of those mental resources constitutes a sense of content, called in-supporting content. It bears content not in the sense of standing-for something in the world but in a sense in an orthogonal dimension: exploiting the external resources needed for maintaining the envisaged problem-solving performance. The in-supporting content generally serves to exploit external resources with a view to gradually forming *guidance* of the required problem-solving performance. The in-supporting content, to see from a different angle, is contentful in an intuitive sense: it consists of the *ways* to exploit an agent's external resources in support of the required performance.

Four categories are immanent in the notion of in-supporting content: performance, support, need, and guidance. Firstly, the role of in-supporting content, quite unlikely that of the traditionally-understood content (to wit, the standing-for-based content), is not to present meaning but to support human *performance* in problem-solving. Presenting meaning, yet, may be a component in the way to support human performance in facing a certain task. For example, understanding the meaning of natural number 1, 2, 3, 4, 5, and 6 may serve as a means to support maintaining the operation of addition 132+465=597. Note that generation of meaning is not compulsory in all kinds of performance. The performance of hand-writing only needs visuo-motor coordination; therein, there is no need to seek the mediation of word meaning. In addition, using a screwdriver would not require generating meaning, although our *understanding of* the behavior of using-a-screw-driver is meaningful. Secondly, while the standing-for-based content has an essential role of *representing* the world (even the "inner world" of humans), the essential role of the in-supporting content is to *support* an organism's performance. The aim of building in-supporting content is not to present meanings, but to support performance, as evident in the activity of handling the pen in hand-writing. It only serves to maintain the envisaged performance—clear and beautiful writing of characters. Thirdly, when it unfolds, the extended mind has an inner core that serves to organize (internal) mental resources with a specific goal, to meet human *need* in the maintenance of the envisaged performance. Problem-solving activities, by nature, have the immanent need of solving the target problem. The maneuver of internal or external resources subserves this need. If it is not constrained by such a need, the activities of resource-maneuver for building in-supporting content are very likely to go astray. Doing something unnecessary or lacking anything needed would jeopardize the performance for problem-solving. It is at least wasting time, which may

sometimes be dangerous or even fatal in certain critical tasks of problem-solving, such as handling the steering wheel or pushing on the brake pedal in order to avoid a traffic collision. Lastly, among the various needs to support the problem-solving performance, guidance is usually the primary one that the internal side of the extended mind is requested to provide. In order to survive in the merciless environment, organisms need sufficient guidance in the light of effective and efficient ways of body control. Handling tools must be subject to correct guidance, although those tools may be so simple that no manuals need to be provided.

Responding to the above four categories of in-supporting content, a question arises. Why should we regard the aforementioned in-supporting content as *content*, given that it differs intrinsically from the content we traditionally understand? To avoid the confusion resulting from ambiguity, after all, it seems wise to adopt a different term, even preserving the part "in-supporting". Replacing the term "content" by "control" or "constraint"—consequently forming "in-supporting control" or "in-supporting constraint"—at first glance, looks sufficient to convey the same idea. However, it seems not so, for four reasons. Firstly, It seems sure that the control of motor activities is neither empty nor blind, nor random, but is subject to certain forms of mental arrangement, even subject to certain forms of conscious planning. Motor control is by no means simply a matter of neural firing. The job of conscious planning, in particular, cannot be accomplished by external resources or mind-tools alone without involving a core of internally organizing activities. Conscious planning needs an active core standing in cognition, a core that is hard to be seen as a mind-*tool*.

Secondly, the activity of organizing (internal) mental resources indeed forms a mental unity. It is the unity of *supporting teamwork*, subserving the envisaged problem-solving performance. Getting a ball in the baseball sport, for example, needs a variety of supports—energy, muscle torque, visual tracking of the flying ball, appropriate motor guidance, and visual-motor coordination. The maneuver of these supports is not to show-off human psychological and physical resources, but instead *aims to* form the unity of supporting teamwork, supporting the task. Given that such a unity is maintained in mental states, however dynamical they are, those states constitute a *mental unity* of supporting teamwork, a unity that may even connect to conscious effort with a certain scenario of supporting combinations. Such a mental unity constitutes a certain organization of standing-ins. Because the maintenance of that unity would be complex, the in-supporting content cannot be scanty and consequently the internal side of the extended mind would not be thin.

Thirdly, given the above, motor control can be seen as in a sense "about" the world, because all the relating mental activities carry information that *aims to* support *external* performance. In an agent's activities of motor coordination, *between* ways of internal control and those of motor performance there exist certain systematic connection, with certain ways of conformity, which can be deemed as constituting a certain non-standing-for sense of mapping. The aimed external performance can be organized on the distal side, through the above systematic connection, by manipulating the standing-ins of the (internal) mental resources on the approximate side. Though it is complex, that systematic connection can be managed in firm and fixed ways, which is hopefully to achieve after sufficient practice, that the (internal) motor control seems *as if* it acts *directly* on the (external) motor performance.

The last reason is to balance the notion of representation. In the literature of the extended mind, there have been various notions of representation serving to explain human interaction with environmental or cultural resources, such as the notions of pushmi-pullyu representations (Millikan 1995), action-oriented representations (Clark 1997), and florid representing (Dennett 2000). Because the notion of in-supporting content apparently also involves agent's interaction with those external resources, and because representations are usually understood as vehicles of *content*, it seems reasonable to claim that what is previously regarded as in-supporting content is indeed a form of content.

The in-supporting content, as above conceived, can be seen as "extended" in the senses that the organizing activities make an agent to act as if she controls *external* resources *directly*, and that the controlling activities unfold in accordance with the need of the task to be performed.

Five Types of Human-Environment Merger

The following discussion exemplifies the notion of in-supporting content with five types of human-environment-culture merger.

1. Bio*technological* Matrix for Retrieving Information via Accessing Devices

Most examples of technology Clark (2003) discusses—e.g. cell phone, clock, paper and board—serve to check information that is readily made available by being stored in the technologies under discussion. Our knowledge of the current time, when the wristwatch is readily available, presents in the form of *using* the wristwatch. What users need in order to get knowledge, in turn, is to *access* the technologies. Agents can know the current time, hence, should their wristwatch be easily accessible. This is similar to the fact that we know how to open a can by knowing how to use a can-opener. Knowledge is carved in the form of knowing how to *use tools that are appropriate* to the required tasks. Although knowledge has been stored in the technologies to be used, agents would not get it until they are able to, and actually, manage to use the technologies in question.

In order to answer the requested question, the agent must organize relevant (internal) mental resources, through which she can know what technological device is relevant to the request, say, what time it is at the moment. Without such knowledge she would be unable to decide what is the

appropriate technological device that she can access in the light of reporting the current time. Furthermore, the agent would also be unable to retrieve the requested information until she organizes her know-how information of accessing the device *and* reading the positions of the wristwatch's long and short arms. The agent's activities of information retrieval are organized into appropriate steps in the light of achieving the requested information. The activity of organizing (internal) mental resources—gathering all forms of knowledge relevant to the request—serves to exploit the needed external resources, namely, raising the arm wearing a wristwatch and operating visual system, in order to read specific information needed for the request. Thus, the activity of organizing (internal) mental resources constitutes the in-supporting content.

2. *Perception*-Body-Environment Integration

The extended mind does not always deal with the tasks of information retrieval via accessing devices. Using technologies is not always as simple as reading the current time from the wristwatch. The motor control of tools, for example, is obviously not. An expert's activities usually do not result from reflexive response of neural circuits. Just doing it (by initiating certain pre-programmed routines) is one thing, while doing it *well* is another. For example, in order to gather good *senses* of bat-control (over hands and the whole body), a baseball batter must keep intensive practice before a competition. In that practice, the batter must pay full attention of where and how the pitcher's ball is arriving, with sufficiently sharp discrimination. The bat-control is by no means a matter of "reflexive response", as it must respond to the unexpected trajectory of the pitcher's ball with sufficient flexibility. Although it indeed requires the immediate control for nearly-reflexive responses (to initiate motor routines), flexibility in response to changeable environmental factors cannot be managed without attention and a good *sense* of bat-control. The internal side of the extended mind, hence, indeed plays a significant role for a *good* performance.

In order to hit the ball with the expectation that it grounds on a good position in the baseball field, the batter requires a variety of (internal) mental resources. He provides visual experiences of activities in the sport field, especially the arriving ball; he also makes available his motor intentions of hitting the ball—hitting the ball to a position without tight guard—and deals with motor planning of doing so. Such mental resources are needed for a good performance. In addition, when the pitcher just threw the ball, the batter must provide visual guidance in support of his on-line motor control. In the light of a good hit, there must be close and dynamical interconnections between visual guidance and motor control. All these are needed for the envisaged good hit. Such mental resources are organized with subtle interconnections and precise timing, thus forming certain in-supporting content held in the batter's (dynamical) controlling states.

3. Bio*technological* Matrix for Managing Tools

Tools, in general, are technological products, however simple they are. Humans manage tools, according to Clark (2003), with their *biotechnological matrixes*, which are results of human-technology merger. The operation of a biotechnological matrix that supports the handling of tools, this paper argues, relies on the construction of in-supporting content. This is evident primarily in the feeling that after training to use tools they seemingly become a part of the body. Consider hand-writing, with a pen on a paper. Although the pen is physically not a part of the body, proficiency makes the agent able to manage the pen *as if* it is a bodily part like a digit. Proficiency is a result of learning, consequently a psychological result. It even allows conscious involvement in the tool-handling activity in order to pursue excellence of writing quality. Proficiency is also a result of organizing psychological resources, by fine-tuning the motor system with subtle order of forces and timing control. Visual experience seems to play a role, as closing the eyes will make the performance more difficult. Whatever the psychological resources being taken into operation, however, the pen-user's attention rests less on the ways in which her writing-hand or fingers move than on the ways in which the pen performs. Proficiency in hand-writing makes the pen-user to seemingly forget how her physical body operates but focus attention on how the pen, as her virtual bodily part, performs in pursuit of excellence. The (internal) mental resources, including the conscious efforts paid for the excellent performance, are organized in support of writing beauty. Different forms of hand-writing need different ways of hand-cum-pen control, and, to see from a different angle, the (internal) mental resources relevant to the hand-writing are organized in different ways. Those different ways manifest different forms of in-supporting content.

4. Brain-Body-Environment Coupling

Hands are regarded by Dennett (2000) as tools like rakes. Feet, in the same vein, will be seen as tools, although hands and feet have different functionality. It seems, as we may infer, that organisms' management of their limbs will have been fully understood in previous discussions concerning the biotechnological matrix for managing tools. However, it is not so. There is some new message concerning in-supporting content immanent in the coupling between bodily parts and the environment. A dolphin's tail well merges with the vortex around it; a bird's feathers well integrate with their surrounding airflow. The principles of environmental factors and how organisms of a specific species can smoothly manage those factors have been "taken account of" (in embodied forms) in the intricate ways of those organisms' bodily control. Phylogenesis or epigenesis transforms organisms' capacity of bodily control in a way that they can better cope with their surrounding environmental factors. For such organisms, those principles of environmental factors and how organisms cope with those factors are embodied (internal) mental resources that

organisms specifically "tailor" in support of their bodily control. Through the course of phylogenesis or epigenesis organisms accumulate and modify their (internal) mental resources in support of their bodily control, in the light of better performance (e.g. swimming or fly). Thus, organisms have evolved or developed in-supporting content for their flexible use.

5. Bio-(Non-Technological)Culture Merge

A variety of cultural innovations have been tightly merged with humans. This is done by learning, which makes humans develop the in-supporting content to manipulate such innovations. Its way of development is sophisticated but quite straightforward: learning the conceptions involving in culture, treating them as internalized cultural resources, and when needed applying them directly or under the constraint of appropriate rules. Although such resources can be fully internalized (in conceptions), they remain somewhat peripheral compared to the above-discussed inner core of the extended mind. Standing in that core is the organizing role of learning, and thereby cultural conceptions can be learned. Humans learn various mathematical conceptions, such as numbers and operations (for example, addition, subtraction, product and division), and the largest common divisor accompanied with the algorithm to achieve it. Humans manipulate mathematical operations, when there is a need in living affairs, e.g. giving change. They also learn rules of reasoning, such as natural deduction, by applying them to judgments. Normative notions such as justice, good, and moral maxims, help humans to develop their sensibility of morality, and ultimately help to maintain moral behavior in human society. Thus, a variety of in-supporting contents serve to apply appropriate cultural conceptions in the circumstances humans encounter.

Concluding Remarks

The present paper preserves a role for an inner core of the extended mind. Two most outstanding ways in which the extended mind unfolds are the human handling of tools and the complex-and-tight coupling between an organism and her immediate environment. It is a core that manages the ways in which the in-supporting content works. It works by organizing various (internal) mental resources to exploit external resources in the light of supporting what is needed in the agent's problem-solving (including body control) performance. That role is salient in the human abilities of maintaining flexible performance. Because it forms the in-supporting content, that inner core of the extended mind is privileged compared to the external resources of the extended mind. The import of the extended mind's internal side is consequently legitimized in embodiment but in a rather discursive sense, in which the autonomy of constituting cognition does not rest on the internal mind *per se* but yields to the ways in which it supports its performance.

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