Marcel Cadaval Pereira / Moura Duarte
Roberto Bartholo / George Barnett Johnston

The Sixth Rung

Introduction

The following text discusses the gains and losses of cognitive dimensions after the *digital shift*[1] and its impacts on the architectural design process, based on Vilém Flusser's "hypothesis that human civilisation has seen two fundamental turning points since its beginning. The first […] may be defined as 'the invention of linear writing'. The second […] may be called the invention of technical images". (Flusser 2000: 7)

Philosophical background

Flusser argues that society evolves toward higher levels of abstraction. The *task of transmitting knowledge* is what determines the level of advancement or sophistication. At the beginning of the book *Into the universe of technical images*, Flusser proposes a model for "knowledge transmission" that distinguishes five moments, or rungs, throughout human history where further levels of abstraction are reached. The five moments set out by Flusser can be summarized as follows:
At the first rung primitive people were immersed in a concrete world; knowledge was transmitted by actions. Very little or no verbal communication was expected.

The second rung is the level of grasping and shaping, when the human beings that preceded us began to design and manufacture tools to improve their tasks. It was the beginning of the acknowledgement of the cause-effect rationale.

"Third rung: homo sapiens slipped into an imaginary, two-dimensional mediation zone between itself and its environment. This is the level of observation and imagining characterised by traditional pictures such as cave paintings." (Flusser 2011: 7) These traditional images depicted

[1] The research project 89+, run by the curators Simon Castets and Hans Ulrich Obrist, suggests the year 1989 as the benchmark date for the digital shift. Marked by several paradigm-shifting events (the collapse of the Berlin Wall and the introduction of the World Wide Web), it is believed that everyone born after 1989 has little or no experience in an "analog" world.

habitats, routines; they were read and interpreted as the cycles of seasons, day and night, birth and death. Per Flusser, it marks the beginning of mythical-cyclical thought.

The fourth rung is the historical level: the invention and evolution of the phonetic alphabet and the concept of linear text that allowed for understanding and explanation, the beginning of consciousness. "A zone to which human beings henceforth owe most of their insights." (Flusser 2011: 7)

The fifth rung has its beginning at the invention of photography and, later, electronic media: radio, TVs and computers. The second turning point in human civilization in Flusser's hypothesis takes place at this level. Flusser, as well as many other philosophers – Ivan Illich, Ernst Cassirer, Susanne Langer, etc. – credit the phonetic alphabet as a major factor that is responsible for the way we think, act and behave. Its replacement by other media as a vehicle of culture would have crucial consequences on western culture and existence, consequences on historical consciousness (Flusser 2010).[2]

Every *new level of abstraction* reached is added to the previous ones. Potentially, levels are never disregarded, and there is a re-balance of strength among them and a tendency to prioritize the later one. The appearance of rungs overlap and their strengths are constantly rebalanced over time. Although it makes no sense to attempt to build a historical timeline for the emergence of each rung, it is helpful to understand how the transition between them might have happened, especially in order to understand the implications of the fourth rung, linear writing, on memory and consciousness.

The first turning point: third, fourth and fifth rungs

Although it is impossible to know the specific time in history when homo sapiens started to communicate with each other through organized speech, not grunt sounds coming through the mouth, we can guess that it might have appeared sometime between the first and third rungs. The intention to record "communication" probably came not much later than the beginning of organized speech. Following Flusser's rationale, the first attempts to record communication were through symbols, and later evolved into a pictorial-ideographical record. The evolution of *organized speech* and its first recorded attempts into formal language brought together a level of abstraction, a new level of consciousness and memory: the mythical consciousness, as named by

[2] Per Flusser's view, history has as many interpretations as the number of interpreters (readers). Their conflicting views evoke further interpretations, and this loop of evolving ideas is historical consciousness.

philosophers. Ernst Cassirer was probably the first philosopher to consider that a deeper understanding of myths was needed.

Myths, sometimes crystallized in dogmas or vulgar superstition, were always excluded from the fields of any philosophical interest: *theories of knowledge* were only concerned with the appreciation of facts. Ernst Cassirer considered human beings to be "symbolic animals", using systems of signs and expressions as means of communication. The ability to define meanings was a human instinct that enabled mutual understanding. This background established the conditions for the origin of knowledge, the more "primitive" forms that underlie the more sophisticated cultural expressions. Cassirer's work sets up a discussion about the dialectical process through which religion and art developed from mythical thought, and theoretical science developed from natural language. Per Cassirer, "Myth never breaks out of the magic circle of its figurative ideas. It reaches religious and poetic heights […] But Language, born in that same magic circle, has the power to break its bounds; language takes us from the myth-making phase of human mentality to the phase of logical thought and the conception of facts" (Cassirer 2014: IX).

Flusser pays specific attention to the *record* of language, and how it evolved into the reading and writing, we have known since the mid-twelfth century. It took around 3000 years for the alphabet to evolve and spread across society. The evolution of levels of consciousness can be noticed throughout the transition from oral to written transmission. "From the seventh until well into the sixth century B.C., reading and writing were confined, in Greece, to very narrow circles. In the fifth century B.C., artisans began to acquire the art of carving or engraving letters of the alphabet. But writing was still not a part of recognized instructions […] a full century before the stylus was imposed on pupils; they were able to learn the texts by heart" (Illich 1989: 23). Homeric epics and other books would be recited in their entirety by using mnemonic techniques such as rhythm and rhymes. The invention of the alphabet and its ability to record such works have induced a level of memory loss. A text, before memorized, was now attached to a clay plaque, parchment, and later, to a sheet of paper.

As well as the slow transition from oral to written transmission, writing and reading have also slowly evolved. At their appearance in the 7th century B.C., authors would write through the hands of others by dictation. Writing was a strenuous job (carving on a leather membrane or a clay plaque) until the invention of parchment and paper, and a professional *scribe* executed it. Around the 12th century, monastery libraries began to create catalog techniques in order to find manuscripts inside their archive. Texts were organized by theme, importance or date, and memory started to grow a new dimension. Texts were read aloud to an audience. Silent reading as we know nowadays was a later stage in the history of reading, and yet it was the most important transformation, the detachment of the text from the page, discussed by Ivan Illich in the book

The Vineyard of the Text. Although there was an evident loss in memory during the transition from oral to written transmission, the invention of the alphabet, silent reading, orthographic rules, and catalog techniques have given to humanity the ability to think critically, as discussed by Flusser. The phonetic alphabet, the fourth rung, gave us the ability to organize things in a specific order, going in one direction, not returning to the starting point. Only after the phonetic alphabet could cyclical thinking be overcome (Flusser 2010[3]; Langer 1984).

Besides the alphabetical order of organization and the idea of hierarchy, the alphabet has given us the ability to track whatever has been filed and consciously look into its internal co-relations in order to find logic and move towards the end of the line, the conclusion. As well as the organization of books in libraries, the subjects spread out over the pages of a printed newspaper and the location of typewriter keys, knobs on radios, vinyl players and film projectors, the analog world has been strongly driven by the alphabet. Flusser's hypothesis suggests that humanity is witnessing a second turning point, climbing a new step towards a higher level of abstraction, a new step yet unknown where critical thought might be reshaped.

"Flusser's original argument relies on its own historical period: the computers of that 'age' could only be manipulated by computer programmers. Interface platforms such as Windows or Mac OS would only be released years later, as well as software programs that would translate commands originally formulated in computing codes into commands adapted to ordinary users, with no knowledge of any programming languages. The idea of computer programming languages that would serve other languages could not be predicted yet" (Losso: FS 16). The general understanding during the initial ages of computing was that one would need to know computer programming in order to carry out a job/work/function in its most efficient way. However, it is important to acknowledge Flusser's efforts to understand the implications of computation during its embryonic phase: the black/green computer screens dependent on specific algorithmic codes in order to function, among other digital-technological advances. Yet, Flusser's hints about "the fabulous new way of life […] emerging around technical images" (Flusser 2011: 7) is one of his most interesting outcomes. What is taken by this work is the rationale with which his arguments are supported. In the digital "revolution" we are witnessing, the alphabet – writing – is taking a peripheral role, and touch screens and virtual tools are the bigger players now.

Flusser's writings did not consider the disappearance of writing, but its reshaping into an "algorithmic" format. Although the digital revolution did not reshape writing into a computing

[3] Per Flusser's view, before the invention of the alphabet the world could only be understood as it was presented, without further interpretations. For instance, the repetition of seasons and their cyclical relations with plantation, the cycles of day and night, and so on. The returning to a starting point was a dominant idea, and the "images" presented (seasons, day and night) would not allow for many interpretations as a written text, and therefore would not evoke conflicts that would cause the evolution of a consciousness. Flusser calls it mythical thought.

code, the hypertexts, the filtering system of publishing, and the extensive reliance on iconographic language, among other examples, have given the virtual transmission of information a format that radically differs from twentieth-century writing and reading.

The sixth rung

Flusser's five rungs can be diagrammatically expressed as follows:

Actions – objects – traditional images – linear text – technical images (partially analog).

The traditional image is an observation of an object, and the technical image is a concept computed in an apparatus, per Flusser's definitions. The gesture of tapping with the fingertips on the keys of an apparatus, a topic extensively discussed by Vilém Flusser, is one of the concerns of this text. The problematics involving the technical images, especially at the beginning of computation, were determined by two considerations combined: (1) a technical image is an innovative way to express a concept. At the fourth rung, concepts were expressed by linear text, following a unidimensional rationale; (2) in order to express a concept through a technical image, one must learn a new alphabet, the computer codes, as well as be restricted to the possibilities of the apparatus, the black box paradigm.

Nearly 40 years after Flusser's writings, the need to learn a computer language in order to produce knowledge is not a reality. There was a shift in the black box paradigm, and the black/green computer screens populated by "new computer alphabets" were replaced by interfaces that tried to simulate the analog logic: the filing systems in virtual folders and their virtual trash, software for writing and drawing, etc. These simulations have become more and more sophisticated. The keyboard was almost completely replaced by mice, pens, tablets and, more recently, by our fingers. There is almost no need to use the alphabet, to write, in order to execute a function: we rely on our fingers' touch and iconographic information previously placed on the screen. It does not mean that the black box paradigm has ceased to exist; there are different levels of sophistication or intuitiveness within these different simulations of analog world. In the architectural environment, the subject of this study, the level of sophistication of simulations can affect enormously the social interactions alongside the design process. The black box is not a static barrier. There is a gradient characteristic within the barrier: layers of "intuitiveness" versus

reliance on new knowledge as well as restrictions of the *apparatus*[4] itself. Vilém Flusser acknowledged that any technology is a potential transformative tool: "There is a complex feedback loop between the technology and the people who use it. A conscience in process of transformation calls for innovative technology, and an innovative technology transforms conscience." (Flusser 2010: 39)

One issue that is embedded in the statement above is the reliance on someone else's knowledge in order to produce knowledge. This has an evident effect on the design process. By design, I do not mean architectural or any other kind of artistic-creative processes only, but any kind of process that produces knowledge: art, science, and technology, as well as its management procedures. The gradient character within the *reliance on someone else's knowledge* relates to how easy or difficult is to deal with *the* new technology. Exploring this gradient is a matter of a detailed ethnographic research project, and therefore is not the focus of this work. This text explores the possible transformations of consciousness by the use of *the* new technology. The architectural process, the *object* of the following lines, is only a familiar domain that I can comfortably use to understand the subject. It is my hope that the rationale behind this work can be applied to other domains.

Drawing = writing? The traditional architectural image

The traditional handmade architectural drawing would not fall into any of Flusser's categories. It cannot be classified as *traditional* because it is not an *observation of an object*; neither is it a *technical image*, because it is not *computed in an apparatus*. The traditional architectural drawing is a handcrafted representation of a *concept*[5]. In this regard, the traditional drawing is equivalent to writing, as well as the text that, in order to be interpreted needs to be completed by the *next lines, paragraphs and pages*. The traditional architectural drawing needs to be completed by other media: texts, material samples, and other drawings. The traditional architectural drawing is a rational/Cartesian translation of a concept, as it is the text. Its linearity is not as obvious and visual. One reason might be that the architectural *orthographic rules* vary from practice to practice, from builder to builder, and so on. As well as in texts, the analogies, metaphors, hyperboles and other figures of speech permeate all the media throughout the design process. The architectural design process seen through the lenses of Flusser's model can be described as follows:

[4] Apparatus in this case refers to software and hardware and how they respond to each other.
[5] The word *Concept* may be misleading in this case. A concept in this case is anything that carries a displaced meaning. The answer to a question or a copy of an existing text can also be considered concepts.

- First rung (actions) – Client's briefing, site visits and any other essential social interaction.

- Second rung (grasping, objects) – Physical modeling, material and texture samples.

- Third rung (traditional images) – Traditional architectural image, as described above.[6]

- Fourth rung (writing) – Contracts, specifications and any other written means of communication.

- Fifth rung (technical images) – Images generated by apparatuses such as photomontages, airbrush renderings or digitally generated images.

As mentioned previously, due to societal changes and advancement in technologies, the complementary relationship among the rungs has changed throughout history. Actions (speech), objects (models, samples), texts (contracts), and drawings (traditional and/or technical) had different strengths in different *eras*, as well as different characters within each rung: clients, managers, designers, builders; design and communication tools, etc. For instance, in the fifteenth century at the construction of the Dome of Santa Maria Del Fiore Cathedral, Brunelleschi was the designer as well as the builder, and he himself directed the bricklayer. Brunelleschi designed through a physical model. He was known to keep his calculations and solutions a secret in order to keep the commission, forcing the builders to rely on him to accomplish the task. Five hundred years later, in the mid-twentieth century, the designer(s) would release a large number of drawings to the builder (a new player), without the risk of losing the commission: written contracts set out the rights and duties of each party involved.[7] Physical models and photomontages were extensively used as part of the process. Speech, texts, drawings and models were present, with different strengths, in both cases described above.

Moving forward 50 years in history, when the use of computation became detached from computing codes, from the mid-1990s onwards, the *new* computerized design process became highly efficient. Among the advantages of the newly created digital drawing technology, the two most prominent were: (1) to erase and redraw little bits of a drawing without the need to make up an entire sheet; (2) to copy, multiple times, a specific piece of design across the drawing. These

[6] As mentioned in previous paragraphs, the "traditional architectural image" is not classified as Flusser's traditional image. The Flusser model is used as a lens to understand the object, not as static categories of classification.
[7] This is a topic itself. There is a book currently being written by Professor George Johnston, School of Architecture, Georgia Tech.

advances had a strong impact on the architectural industry: a reduced number of staff were now able to produce a great number of drawings in a much shorter time. The digital two-dimensional architectural image, the CAD image, belongs to the fifth rung: it is a technical image.

Despite the black screens populated by colored lines and shapes, the digital drawing technology, two-dimensional CAD, is still a simulation of a hand drawing. One needs to translate his thoughts into a two-dimensional geometric code of lines and shapes, line weights, shades and colors. Apart from the speed and reduced staff, the "vocabulary" and its "orthographic" rules remain the same, as well as the flow of information within the design process. The flow of the design process can be simplistically described as follows:

Actions and initial architectural images (traditional or technical) become a program.[8] *The program and actions (verbal communication) feed the design team; the design team produces further refined architectural images and texts; the refined images and texts undergo further actions; further actions adjust the program accordingly. The program and actions again feed the design team*… This continuous loop ends when a design is agreed upon or when the client is running out of time, whichever comes first. The number of loops until the project ends depends upon time, the complexity of the design, the ability of the design team and the ability of the management.

The so-called *digital shift* added new layers to this process. One new character, an instantaneous-simultaneous interaction, is changing the two-dimensional rationale behind the design process, as well as the information flow, poorly described above. Different actors can edit the *work in progress objects* (text or drawings) simultaneously. The unidimensional linearity of the process has shifted to a network-like progression, the history of any design process has become harder to be traced, and a much wider range of interpretations are now available. The design objects (texts and drawings) have acquired new dimensions: the so-called *revision*, the *still moment* from an ongoing process, is not as *still* as before. This interactiveness, added to the different levels of analog simulation, have clouded the lens that looks at the process.

Another feature of the simultaneous interaction is that one can easily access information previously placed in a source. The so-called virtual libraries embedded in the apparatus, a predetermined group of materials, textures, details of joints and transitions, furniture, etc. Generally, these libraries are open to its users to add new items at any time, making it an enormous source of data. Dealing with this *big data* is becoming a matter that is more sophisticated than the creation of new data, the creation of new knowledge. The new consciousness has become a matter of finding, filtering and combining the relevant data from the existing source; it is not as much a matter of producing new knowledge. One can argue that the same rationale has its analogy in the

[8] Text that describes the client's requirements. It is the architect's starting point. It could be a single page or a multiple-volume document, depending on the complexity of the product desired. Generally, this document is constantly adjusted during the process.

twentieth-century analog libraries (the re-collection of pre-existing data and its further combination), yet two differences must be highlighted: (1) not everything could be instantly and freely added to a twentieth-century source of data. There was a screening – a selective process previously made by one person or a group of people, the role of the editors, a subject discussed by Flusser. The discussions between authors and editors is controversial, and in many cases it has an authoritarian character, but the majority of knowledge produced was submitted to further discussions and would, anyway, evolve, even if it were still susceptible to rejection. The author-editor relationship does not apply only to books in libraries, but also to a standardization of details or material samples or anything that needed to be reviewed and accepted by a more senior authority. (2) The way the information was displayed during the analog era allowed for a much wider range of interpretations. The simple gesture of touching and reading a written text, a printed image or a tridimensional object, the acknowledgement of the real tridimensionality of the *things,* gives a sense of freedom/empowerment to interpret in an adverse or even skewed path.

The recently created design tool Building Information Modeling (BIM systems) is an additional character in this problem, applied to the architectural environment. Cognitively distant from the two-dimensional representation, the BIM is not a simulation of a hand drawing, nor is it a simulation of a construction site. A virtual construction site exceeds the limitations of a two-dimensional representation. Any shape created in this virtual construction site can, potentially, be measured and built, considering the use of tridimensional printers and similar apparatuses. The mental process of understanding an object, breaking it down in plans, sections and elevations, is now placed within a computer algorithm to be sent straight to the *printer*. The representation of a helicoidal stair by a traditional two-dimensional method, for instance, would rely on descriptive geometry knowledge to produce accurate measurements as well as the gesture of drawing the lines to represent its steps, and the additional lines to represent the handrail, that would ultimately force the designer or draftsman to acknowledge that the handrail should be joined to the step, even though this *joint* would be developed later on. In a BIM-like environment, an equivalent stair is pre-stored in a library. Joints, details, and textures are pre-set. Every parameter can be manipulated and new ones can be added, but the latter is rarely the case. In an environment that relies on pre-set data, the creation of new or bespoke features are even more distant from the design process.

The second turning point in human civilization stated in Flusser's hypothesis might be occurring now. In the case of the design process, there is no longer a need to know descriptive geometry or two-dimensional representation in order to know how an object will be constructed or manufactured. Details, joints and finishes are either embedded within the "apparatus" or they are dimensions – impossible to be measured in a traditional architectural drawing – that will be sent

to the printer, without further human thinking. Knowledge is being placed in a virtual model and, maybe, is freeing up mental room for new kinds of judgment, a reshaped critical thought.

The fifth rung proposed by Flusser, the Universe of Technical Images, had a tremendous impact on industry, economy and society: they were efficient technologies that sped up the processes, as well as laid off a big chunk of the workforce. It was an efficient simulation of the analog world but did not reshape *historical consciousness*. We might be witnessing the beginning of a *Sixth Rung*. As a reference to Vilém Flusser's writings, it might be called the Universe of Virtual-Interactive Media: non-existent (virtual) tools manipulated by multiple characters, generating multiple possible results. As well as the *text* that became detached from the page around the twelfth century, tools are becoming detached from real objects and the complementary relationship among the five rungs has ceased to exist: actions, objects, texts, and images (traditional and technical) are now combined, merged in this virtual environment, and our consciousness is undergoing a transformation due to this *innovative technology*.

Per Flusser's quote: "Two possibilities to face the world, one is through image and other is through linear writing" (Flusser, 2013). We are facing a third possibility, the non-existing (virtual) interaction.

The *flusserian* logic sets an interlacement between the fourth and fifth rungs: technical images and texts may restrain the interpretation of one another. At the sixth rung the amount of intellectual technologies is much greater and its interlacement more complex. For instance the *grasping* property of the second rung, not accounted as a vehicle of consciousness on Flusser's rationale, seemed to be a highly important feature to carry consciousness at the sixth rung: tools acquired virtual functionalities detached from real objects; its use is an interpretation itself as well as a vehicle of consciousness, not necessarily the object produced by the tool. Interestingly the iconographic *vocabulary* placed at the computer screen and used by the virtual tools can be understood as a return to a pictoric writing, a neo-ideographic alphabet. In an architectural design process the design tool - BIM model - besides allowing indefinite ways of use, one of the big challenges is to grasp the X-*dimensionality* of its virtual existence. The *traditional* bi-dimensional representation is a simplifier tool that extinguishes the parallaxes of a tridimensional observation as well as provides its true dimensions, any complementary information is carried by additional objects such as texts, schedules, physical and digital models, etc. The complementary relation among these objects keeps their independence: they address each other but don't rely on each others' existence in order to operate. On the BIM model, a tridimensional virtual object, the complementary information is embedded within the system and depends on the other's existence in order to fully operate. It is not possible yet to interpret all these layers of information by only observing these tridimensional virtual images bi-dimensionally projected on a computer screen or bi-

dimensionally printed on a piece of paper. Access to hidden information is necessary to enable interpretations that are equivalent to interpretations of texts, architectural drawings or even the interpretation of an interlaced system of texts and technical images. At the sixth rung relevant information or data is not accessible right away, if accessible at all, this might compromise any further interpretation. The consciousness of the design process or its historical consciousness - an evolving loop of conflicting interpretations - is being replaced by a web of interdependent connections that do not necessarily move forwards, and do not necessarily return to a cyclical pattern. This virtual web of connections opens up possibilities that overcome the linearity of historical consciousness. An effect analogous to the overcoming of mythical thought by language. It might be the beginning of a new consciousness where any missing piece or turbulence at any one or more connections might take the system to undesired or unprecedented paths. We are experiencing an early stage of the sixth rung, therefore any attempt to describe or acknowledge its effects on society is premature and ultimately inaccurate, however an admittedly incomplete definition must be made in order to open a void for further critics and keep the *flow* of historical consciousness, at least while it still remains in its actual shape:

The Sixth Rung is a level of interdependent information web: the invention and evolution of non-existent/virtual tools and simultaneous interactivity of its unities. A zone where linear thinking is replaced by multi possible dimensions.

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