"Insertix"

Grafting 'XY' Factor in Engineering & Design Creativity.

Prof. Dr. Iko Avital*, Assoc. Researcher Charu Monga**

* ikoavital@gmail.com ** charumonga5@gmail.com

"Eventually everything connects – people, ideas, objects. The quality of the connections is the key to quality per se." Charles Eames, 1907-1978

Abstract: This paper introduces 'Insertix' a new context model of connectivity and internal interactions between individual factors. It adapts and uses grafting method as a creative platform of internal relationship, for innovative engineering and design thinking. It will also trace cognitive process of bridging human-center design and technology gap by embracing personal and cultural perspectives. Insertix offers hundreds by hundreds of 'jumping together' stimulus that helps ideates from irrational state, innate spiritual sphere, and subliminal ground.

Key words: Personal and Cultural Resources, Grafting Techniques, tracking combinations.

1. Introduction:

Nature, phenomena of the physical and metaphysical, seen and unseen world - teach us how engineering and design exist everywhere in a creative and divine teamwork synthesis. In every tree and seed, every stone and drop of water, in a tiny feather of Humming bird or the huge feather of Andean Condor. Nature teach us also how processes and methods are connected in a way of How, What, When, and Where, in a synchronized world. A cosmic harmony of collaboration between flora and fauna, water and soil – in a rational phenomenon from concrete to abstract and otherwise. Methods in Design (15, Jones, J. C) by years enable lot of fruitful thinking paths for engineers, architects and designers, in tailor-made procedures of problem-solving. The desired need for ideas, this dreamy "AHA" moment, came with the analyzed methods that try to unfold how designers think (16, Lawson, B); These also present different approaches of designing methods. Inquiry in agriculture and observation on farmer's methods taught us how combination and recombination techniques can dramatically improve their

yield. Composition of different branches or leaves by inserting, create a "new" idea of flower, tree fruit, etc. Inserting in different ways, links together Design and Graftage to a Consilience method. We also studied one important thing: every branch, every leaf, in this graftage process, has its own quality which makes the outcome so "new", unique and different from others. Every creative individual, designer or engineer, has his own personal and socio cultural background. Using these faculties and traits may generate authenticity and self-voice in Product Design. Insertix method combines the Self in design process, in varied combinations and compositions to ensure originality and flow of "new" ideas.

2. There is a tree in every seed

Every traditional culture uses a tree as a symbol of human life, as a sacred metaphor of figural, structural and semantic integration and interactive connection with human being. From its formation such as roots, trunk, branches, leaves, flowers, fruits and seeds; and from, its important role on earth such as shadow, air oxygenation, nesting shelter and feeding insects, birds, monkeys and people - to a spiritual divine synthesis symbol that bridge sky and earth. Close and profound observation on a tree, every tree, can give us some explanation and certain insights why it became an important icon of creation and view of knowledge, by psychologists, philosophers, theologians, and multidiscipline scholars. Gardeners can witness, how every part of the tree function and connects in a holistic stream with others, in a silent and harmonic symphony. This Tacit Knowledge (10) exists in Nature, flora and fauna, including all creatures, from any category, scale, size and type, visible or invisible to us. Everything connects, everything relates, everything contextual. Arts are a humanity tacit knowledge when creative people ideate from irrational state, innate spiritual sphere, and subliminal ground. This unity of knowledge, (12) suggests the synthesis of sciences and humanities. "Literally a 'jumping together' of knowledge by the linking of facts and fact-based theory across disciplines to create a common groundwork of explanation" (12, p.7). The link from genes to culture is that what shape our brains, allowed us to work with memes as the basic unit of culture. Later, other methods characterized by complexity of those domains, as a Tree of Knowledge (6) that proposes four degrees of complexity: Matter, Life, Mind, and Culture. Even Mind Mapping (3) practice use organic and structural procedure that uses roots and branches as visuals of thinking and Meta thinking. Everything connects and in context but so differs as well. Every fruit of a tree or plant is different by appearance, taste, and aroma. Indian tea from Assam has no same flavor like tea from Darjeeling; French wine from Burgundy has different characteristic experience than Bordeaux, the same in Italy: Tuscany wine is not the same like this from Campania. Besides personal traits and qualities, there are other factors like climate, soil, water and topographic landscape; besides environmental interaction with animals and human-being. These, make the differences, but on the other hand brand the authenticity and uniqueness of every cup of tea, every glass of wine. Thus, mankind identity and authenticity growing from sociocultural context and demographics, based also on physical conditions such as climate, soil, water and environments, animals, etc. Everyone's life, thoughts and creativity potential is composed and sprouted from his own personal roots and culture. The way how they 'jumping together', give birth of creators - Designers and Engineers.

2.1 There is engineering in every product, and otherwise

All design disciplines are connected to all engineering disciplines, and otherwise. It could not be disconnected even when design access to crafts and art forms. Not only in industries of mobility, communication, agriculture, and education; but, every daily products and services from food, retail, and advertising - to fashion, packaging, theatre, movies, entertainment, and so on. Four problems could be identified in this tight connection between Design and Engineering. Firstly, understanding the psyche-social personal needs of multi-sociocultural consumers and users, in a sub-cultures and multi-lingual era of global and inter- migration. Secondly, there is continuously high demand in all kind of market segments for innovative products. Third, how creative designers and engineers can continuously keep and energize their creativity flow, (4) curiosity, openness, and determination; how they can express their own authenticity, and personal 'say' – in an era of "Mass" (production, consumption, marketing, shopping, media, entertainment), when esthetics values are dominated by technical rationality (13), and dictated as major "trends" by global corporations, running over localization and micro-cultural diversity. Forth, and maybe the most crucial problem is the curricula lack of practical studies in Design and Engineering creativity is a crucial milestone to engine ideation and energize passion for authentic and innovative outcome. Other side, basic literation in psychology, sociology and anthropology is really needed; it could deepen and widen the understanding of human spectrum - internal and external- world of individuals, and communities. Professional knowledge should involve personal and cultural experiences, mixed by technological and social sciences skills.

2.2 From concrete to abstract and otherwise

As design and engineering have become increasingly collaborative, multidisciplinary, entrepreneurial, and global, and as the pace of change of technology has accelerated, the expectations for innovative products have expanded widely; there is a desired need for an ability to function on multi-disciplinary teams; and crucial professional need for creative generators, innovative outcome, products, system, components, process and services. Some argue that sketching as a main method of design processes, may not sufficient enough in nowadays, when products are integrated with so many other disciplines, when designers and engineers are mostly focused on problem solving phases, when products are 'designed' by software's. Efficient tools for engineering and design totally changed the processes of work. Multidiscipline projects involve more than professional skills; we spend most of the time in front of our laptops, discuss net and network, and enjoy gadgets. We focus on 'form', 'Function', 'Emotion' and other design trends, but maybe by that we also miss real human-touch of important factors such as Cultural Patterns: Ritual, Custom, Myths, Tradition, Nostalgia, Heritage, Faith, Legends, community and family stories. We also skip the personal authenticity of the designer or the engineer. There are two faces of innate setting: one, multi-modality of Physical, Perceptual, Emotional, Inter-Personal, and Behavioral. Second, of psyche - Reflections, Hallucination, Day Dreaming, Fantasies, and Dreams. Thus, personal and cultural themes are crucial factors of design resources, spring of innovative ideas that could generate atmosphere of inventiveness. These, with human sciences literati can improve intellectual skills, and will lead to deep abstraction thinking. Another source of innovation could come from observation and practice of arts and crafts. Concrete phase of practical activities will insight tacit knowledge by developing self-awareness, will generate intuitive creativity, and will stimulate images and imagination. Smart integration, of personal and cultural roots of the creator will ensure his authentic design or engineering output.

'Insertix' is a consilience method that integrates these factors by imitating farmers that improve their produce of fruits or flowers. They absolutely found their own unique techniques of 'jumping together' to innovate their production by natural integration of knowledge – from an idea to practical, from abstract to concrete.

2.3 The desired need for "AHA" moments

The concept of 'Insertix' method is to setup a creative and contextual process of time and space for selfintrospection, reflecting consciously thoughts and feeling, letting images pop out. This self-place provide spiritual intimacy and access to one's mental state of day-dreaming. This kind of 'voyage of discovery' (8) involves an immersion in the creative imagination, that allows to find one's own way to innovate spontaneously without the need to control outcomes, in an irrational self-track. Creative discovery is the embrace of the unknown, is the way one's trust the process (10) of freely exploration, is the way ideas and images emerge through self-introspective session. This contextual thinking is also a kind of self and life-long learning that acquiring new insights, knowhow, skills, and values about personal and cultural roots; may involve synthesizing different type of data, visuals and output. These activities can cause 'AHA' experiences, suddenly understating, flowing performance of images and visions and deep insights. Virtual correspondence between imagination and execution causes tacit knowledge of "knowing more that we can say" (13, p.51); plenty fertility of creative sources, based on his Personal and Cultural background, encourages self-confidence of the creator and lead to an insight of "to accept yourself, which makes your work personal, and in your own voice, which makes your work distinctive" (2, p.3). Innovation and creativity need a brave and risky self-exploration, a spontaneous room to respond authentically. Our long academic experience have point out the fact, that lot of design and engineering students do not feel free and safe enough to imagine wildly; losing their self-confidence when it comes to new ideas delivering. Last decade, students are loaded with so many tools, tempted by attractive software's personal gadgets, net and social-net, and all kind of easy-to-get data. In spite of that - there are low production of ideas and new innovative concepts. We, professionals, always complaint that our client cause lot of obstacles, stress and narrow the horizon flow of our creativity – but we never blame our curricula education that hardly changed for decades.

3. The Method

'Insertix' is a method that links together Design and Graftage to a Consilience method. Graftage ^{is} process of making a graft in horticulture, the technique in which the separate parts of some plants are caused to grow together as one plant. Graftage is used to produce such novelty plants in basic technique, when a plant is selected for its roots, the other plant is selected for its stems, leaves, flowers, or fruits and is contains the desired genes to be duplicated in future production. Most tree fruits, camellias, and roses propagated by Graftage.



'Insertix' Designed as a physical object of two parts: a 'stem' axis hinges a roll 'flower'. The axis, from one side, include **X Factor** (Personal Factors: Emotions, Traits, Moods, Personalities, Demographics); when from other side, **Y Factor** (Cultural Factors: Arts, Crafts, Rituals, Custom, Lifestyle). The Roll has six variables of methodical phases: 'Hook', 'Punch', 'Slice', 'Wrap', 'Mix', 'Bunch'. These variables open up a rich situation in creative thinking, when the ratio of selected themes (let say: X2+Y8, or X5+Y7+Y10) can be mixed into different mode. For example: X2+Y8 could be 'hooked' or 'punched', when X5+Y7+Y10 could be 'sliced'. This arranging procedure became, for the creator, an abstract metaphor when hierarchy of themes and micro-themes deepen and widen the creative thinking, practically or abstractly, and may cause and create surprising and unusual combinations. The X list (1-5) or the Y's are divided to sub-themes that could be listed again; X2 could be for demographic which include lot of factors. By choosing 'age', new list of options are presented: babies, toddlers, teenagers, adults and so on. Even 'adult' itself may open up again a new list from 'twenty' to 'seventy' etc.



By inserting **XY** factors - let say, **Y6** for "Circus", and **X1** for "Emotions" – this phase will shift design thinking dramatically to a creative sphere as a concepts' generator. Other example is like- In 'Brunching', if X is the main factor that is "Emotions" and Y1 is any "Craft" and we will add more traits of crafts like Y2, Y3, Y4, Y5 etc. The output is going to be a shocking and mind boggling answer.

3.1 Insertix Matrix

'Insertix' is divided into two parts of stimulus. When one is Personal traits (like memory, Experiment, Relation, Dreams), the second is Cultural traits (like Craft, Art forms, Religion, System, Ritual) - Grafting is going to be the linking and key process. Engineering and Design are going to work in between these two Insertix links. Looking

	X 1a	X 1b	X 1c	X 1d	X 1e	X 1f
Y 6a						
Y 6b						
Y 6c						
Y 6d						
Y 6e						
Y 6f						

closer into chosen them, like "Circus", there are lot of topics: acrobats, clowns, animals, orchestra and so on; when 'emotions' could be a long list: Positive emotions such as surprise, joy, love, sympathy, hope; or negative emotions such as hate, cruelty, greed, frustration, grief, fear. So, Y6d for 'acrobats' will meet X1c for 'fear', in two optional situations. One, the first theme will dominate the second: Y6d> X1c, or otherwise. Next phase, grafting in one of the options such as 'punch' – the fear of acrobats as the concept, or by 'slice': a separate topic of 'fear' and of 'acrobats'.

4. Conclusions

Using 'Insertix' as a useful method of teaching, during our long experiences in HIT and IIT, provided a safe platform for students to start any task from their own self, their own place. This method enriched the class atmosphere, turned it up to a safe place that allow every participant to share his personal life and emotional spectrum with others, team or class. For professionals, this method open up a safe umbrella of contextual micro-themes under their project brief, and allow them to upload their very own self into their creative work.

A. **Autonomy:** Safe place, virtual or physical, create energy to create. This kind of energy allows emotional memories and dreamy images, during creative processes, <u>to dare</u> to be brave and courageous, to challenge local or global trends, and not to be a part of a herd of "Good Design" endless debate.

B. **Inspirations:** Mixing themes in design is not a mathematical calculation. 1 + 1 could be everything in creativity thinking, 3 or an apple, cloud or a question mark that can inspire ideation and be a door to innovation. Spending time on self- <u>introspecting</u> upwards images and emotions to a conscious level that will transform to new ways of designing.

C. **Ideation:** The practical structure of 'Insertix' present a collection of hundreds by hundreds combinations, that invite creators to use his own imagination, and teases them to fly to other worlds. Long-term of tracking facts, procedures, principles, processes, concepts - end with self-guided discovery implementation level of ideas and innovations.

D. **Authenticity:** the use of personal background, and Interpersonal environment in this wide optional thinking method, ensures authentic and unique outcome. The <u>self-process</u> of absorbing, doing, interacting and reflecting will track the creator to his own path, good or bad – but original.

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