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REAL-WORLD DESIGN TEAM ACTIVITY: WHAT IS POETRY FOR?

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ABSTRACT

Shared understanding is often the ultimate goal driving any communication exchange. In an industry-based context where multi-disciplinary design teams are commercially employed to deliver timely and concrete outcomes, establishing a common understanding amongst team members is imperative for achieving the deliver timely and concrete outcomes.

One of the challenges faced by Multi-disciplinary design teams is the clear communication of discipline-specific information to colleagues who may not share the same technical or procedural frame of reference. It is not uncommon for senders of expert-specific messages to find that intended recipients do not comprehend the message's original meaning. In such instances where a message fails to create common knowledge, a sender might choose to renew and re-communicate it by employing language from another domain as a strategy for generating greater clarity and alignment amongst team members. In this negotiated understanding, technical language may be replaced by figurative or poetic language as a way of overcoming previous gaps in transmission and comprehension of design thinking.

While linguistic concepts such as analogy and metaphor are often associated with literary domains, this paper explores the ways in which messages that were previously constrained by the precision of technical terminology might be transformed into a more effective medium by the use of connotative and creative language in design contexts.

INTRODUCTION

Communication is most often in the form of language, in design teams there are a range of communication options including graphics and gesture but the predominant means of communication is in spoken language. Of interest in this paper is that the use of spoken language is often "enhanced" through the application of poetic form, most notably metaphor or analogy. This paper explores the concept of analogy and then considers its prevalence of use by members of a design team whilst designing in the industrial context.

In his primer Why Poetry Matters, poet and academic Jay Parini (2008, p. ix) reflects: 'Poetry doesn't matter to most people. That is most people don't write it, don't read it, and don't have any idea why anybody would spend valuable time doing such a thing.' However, his text adumbrates more fully the nature of poetry as he advocates for its uses and applications to be recognised in wider contexts. Parini is not alone in his eloquent plea for poetry to be regarded as a relevant, central and dynamic art form with poet and literary critic Edward Hirsch also underscoring its social value in his statement:

> Poetry is as ancient as the drawing of a horse at Lascaux, or an Egyptian hieroglyphic, and yet it also feels especially relevant to a post-9/11 world, a world characterized by disaffection and materialism, a world alienated from art. The horrors we face daily around the globe—terrorist bombings, ethnic cleansing, the ravages of the HIV epidemic, children becoming soldiers— challenge

us to find meaning in the midst of suffering. Poetry answers the challenge. It puts us in touch with ourselves. It sends us messages from the inventor and also connects us to others. It is intimate and secretive; it is generously collective. (Hirsch, 2006, p. xiv)

While Hirsch's comments largely point to the ontological, heuristic and consoling role that poetry can perform in contemporary circumstances, the suggestion of poetry's latent capacity to respond to communication challenges and assist in the building of a shared community is something we wish to explore further in this paper. The notion that poetry can be utilitarian when it works as a 'means of exchange' and a 'form or reciprocity' (Hirsch, 2006, p. xv) is particularly pertinent to our discussion on communication strategies for multi-discipline design teams.

Using aspects of poetic language as a practical intervention in commercial scenarios where team members may seek to clarify, refine and renew discipline-specific information may, at first, appears a little left field. This would particularly be the case if the language of poetry was commonly regarded as a rarefied, esoteric and aesthetic art form with its 'distinctive features' defined (and limited) by 'form, rhythm, rhyme and the often elliptical style' (Thorne, 2006, p. 9). Importantly, we wish to expand that referential framework and make a case that poetic language, in particular, matters (or is useful) because 'it refines our ability to make comparisons (Parini, 2008, p. xi). The use of analogy and metaphor, so prevalent in poetry, can create stepping stones as a pathway to new understandings. Peter Stanlis helps unpack this idea when recounting an interview with celebrated poet Robert Frost:

> Frost compared a poet to a man standing at the edge of a Vermont boulder-strewn field, trying to reach the other side of the field by leaping from one boulder to another, without touching the ground. Since the boulders are scattered he cannot cross the field in a straight line, as a scientist or expository prose writer would, but must use metaphors, analogies and figures to zig-zag his way across. Through his imagination the poet must leap from one boulder to the next and the next; only with audacity, courage, and skill will he reach the other side without falling to the ground or finding himself stalled with no boulder to leap to, never to arrive at his destination. And, Frost emphasized, there is no way to retrace his way once he has made his first leap or two. He will either cross the field or not. (Stanlis, 2010, p. 59)

While Frost's analogy describes the fundamental task a poet has in drawing on the most effective tools to create and send a message to a reader, his analogy also serves a dual purpose of highlighting the task ahead for design team members as they seek to create 'boulders' of shared knowledge during the process of creating a design. Dobson's (1978) poem provides an interesting analogy in itself describing the joining of ideas to create meaning is like moving across an expanse using "stepping stones".

> 'And the poem that exists
> will never equal the poem that does not exist.
> Trembling, it crosses the frontier at dawn
> from non-being into being
> carrying a small banner,
> bearing a message ... .'
>   —Rosemary Dobson, Over the Frontier

THE CONCEPT OF ANALOGY

Whilst technical language remains a critical element in the discursive practices of multi-discipline design teams, we posit in instances where referential and precise language has stalled and not comprehended by other team members that poetic/figurative language might be drawn on as an intervention for renewing and transforming the original message. Because, as Eagleton (2007, p. 42) argues, poetic language is "verbally inventive", those involved in a communication exchange that requires comparisons to be made between similar objects or concepts may find less constrained and more connotative language assists them in the production of a shared understanding. The recourse to analogy or metaphor can be seen as an act of creative expansion and adding a layer of personalised meaning for those involved in a communication transaction. Such a personalised transaction may increase team bonding and social cohesion as evidenced in Berthoin Antil and Strauss'2013 (p. 18) work where it is stated 'Improvement in internal relationships is one of the most frequently mentioned effects of artistic interventions'.

One of the motivating reasons for drawing on analogy or metaphor, put simply, these demonstrate how two things are alike by highlighting shared characteristics, for the purpose of showing that if two things are similar in some ways, they are similar in other ways as well. These may be used in the identification or explanation phase of a project would be the need to make the intended message clearer, thus increasing the possibility of achieving the desired outcome of a shared comprehension between the 'maker' and the 'appreciator' (Cohen, 1978) of the message. When someone employs analogy or metaphor as a mode to communicate correspondences/associations/ relationships they participate in a conceptual mapping exercise that often relies on a strategy of using 'familiar concrete domains to discuss less familiar or abstract domains ... ' (Gentner et al, 2001, 202). Drawing on the work of cognitive linguists, the categorisation of one conceptual domain in terms of another one is often how metaphor (and we would also argue analogy) might be defined (Kovecses, 2010). As Kovecses further explains:

The two domains that participate in conceptual metaphor have special names. The conceptual domain from which we draw metaphorical expressions is called source domain, while the conceptual domain that is understood this way is the target domain. The target domain is the domain that we try to understand through the use of the source domain. (Kovecses, 2010, p.6)

However, intrinsic to the effective correspondence and mapping between the source and target domains is the 'principal of unidirectionality' (2010, p.6) where 'the metaphorical process typically goes from the more concrete to the more abstract, but not the other way around' (Kovecses, 2010, p.6). Or as Rhian Williams (2009, p.216) contends, 'becoming increasingly alert to poetic uses of figurative language can give you a new awareness of wordplay in all your encounters with the world.' This alertness to possible 'wordplay' may ultimately enable a team member to shift from the technical to a more aesthetic, figurative or imagistic mode of address as they more creatively map a concept for other team members.

We acknowledge human encounters are complex and that linear models construct a communication act. This communication can be regarded simply in terms of a message being sent from a sender to a passive receiver. Communication in team contexts typically involves collaboration and the lack of sophistication in a linear construct may pose difficulty in creating shared understanding. Therefore, the transactional model of interpersonal communication best explains and 'emphasizes the dynamism of interpersonal communication and the multiple roles people assume during the process' (Wood, 2013, p.17). Wood's model dispenses with the binary categorisation of sender and receiver. Instead it portrays participants as communicators 'who participate equally and often simultaneously in the communication process' (Wood, 2013, p.17). And importantly, as Wood points out, 'this model includes the feature of time to call our attention to the fact that messages, noise, and fields of experience vary over time' (2003, p.17). While communication encounters can take place amidst flux and various interferences, participants may choose to reduce this 'noise' by renewing messages via the resources of more creative and poetic language resources.

The preeminent poet Wallace Stevens' (2009, p. xiii) astute summation that 'Poetry is a response to the daily necessity of getting the world right' is also somewhat indicative of the task confronting a multi-discipline design team when working to ensure their messages and responses correctly align. Their task too is to get the world 'right.'

THE PRACTICE: INDUSTRY CONTEXT

The project on which this paper is founded explores how members of a multidisciplinary design team communicate, or share, ideas related to technical information and design concepts as part of the design team's activities. The research project monitored a real world design team engaged in a major design project requiring a year for the design phase of the design and build project. The design team was involved in team designing a phase 3 version of a light rail carriage for Hong Kong. The team comprised members from a diverse range of discipline backgrounds, domain experience (within the railway manufacturing industry), and company experience. The team was established for the development of an updated version of an existing train model. The principal team consisted of sub-teams who focused their attention on specific aspects or components of the design, e.g. the drive system or the driver console. This situation necessitated that sub-team membership to be dynamic, responding to the specific design needs existing at any point of time during the project. The necessity for forming and reforming teams as the specific design need arose led to a fluid design environment where designers were brought together for a specific purpose and once completed the design sub-teams reform to address new design tasks. This situation led to the designers having to adapt to a changing group of design collaborators as well as communicate a diversity of design concepts.

To effectively monitor and analyse the design activity of the team, the research project adopted a methodology that allowed consideration of both verbal and visual interactions. To facilitate this approach, design meetings, both formal and informal, were recorded on video over a 12-month period. The design activities monitored were associated with the design of the light rail system. The study involved the coding of over 14,000 communication instances which advanced the design aspects of the project, i.e. team management and social interactions were not analysed as they did not relate specifically to design communication. The team structure fell across two of Maher et al's. (2000a) team structure of intermittent team collaboration and leader lead collaboration in that the sub-teams had autonomy in their design activity but when bringing the design components together the primary team was managed by a project manager who was responsible for the organisational structure of the sub-teams entailing the moving members of the sub-teams across to other sub-teams to provide specific technical or discipline expertise so as to meet the specific design needs of the sub-team.

The analysis of coded interactions involved considerations of the communication instances using a developed framework. However, in order to accommodate the range of communication types employed within the design team (Holt 1991), the methodological strategy of interaction analysis was combined with discourse analysis/language constructs and protocol analysis. Moreover, the recorded design team interactions were analysed using the Noldus Observer video analysis system. Through merging the methodologies of interaction and discourse analysis

together it was possible to analyse both the visual and the verbal interactions. The final phase, statistical analysis, considered the frequencies, correlations and variations so as to better understand what contributed to effective communication amongst members of the team.

THE RESULTS OF THE STUDY

From the study of the team members' interactions, it is apparent that designers employ a wide range of communication strategies during their design collaboration in their endeavour to achieve a shared understanding of the specific aspect of design under consideration by the team as they progressed the project. What was evident was that combinations of verbal and visual forms of communication were both common and integral to the collaborative design process. Table 1 outlines the range of verbal and visual communication strategies used by the Project Team. As indicated above, only the design related communication instances were included in the analysis, communication which related to other aspects of the team activity were excluded from the analysis.

VERBAL STRATEGIES	VISUAL STRATEGIES
1. Technical Language	3. Gesture
2. Analogy	4. Graphics - Sketching
• Project specific • Domain specific • External to Domain	5. Existing Graphics 6. Actual Objects

Table 1: Communication Strategies Employed by the Team

Of specific interest to this paper is the communication strategy of analogy which was evidenced in three forms:

- Primary level - project-specific analogy;
- Secondary level - domain-specific analogy;
- External analogy - analogy from outside the domain.

These are detailed more fully in the following:

PRIMARY LEVEL ANALOGY

The primary, project specific, analogy relates to references made by designers to aspects of the current project being addressed. When an issue arose and needed clarification, the initiating member made reference to an aspect of the project that the team had previously solved while working on that (same) project. Examples of the primary level of analogy used include:

- "use the same locking system as we used on the floor panels";
- "yes it's the same as we used to join the wall panels";

SECONDARY LEVEL ANALOGY

The secondary, or domain specific, analogy employed by the designers drew from the broader domain of locomotive or railcar production. In form of analogy the designers made reference to railway projects that they had worked on in the past or that they may have had some experience with or have made reference to in the past. Examples of the second level of analogy used by the designers in the study include:

- "why don't you cast the anti-chamber like we did on the Sprinter project";
- "its the same destination signing system as they use on the London underground".

The above are examples of the analogy used in the design discussions, or as part of the design communication. Though the designers were not using poetry they still drew upon the same linguistic strategies which poets do, but unknowingly.

EXTERNAL ANALOGY

The external analogy was drawn from outside to the rail manufacturing domain or industry. The designers when using this form of analogy to communicate concepts would draw from a diverse range of technological fields and non-technological fields. This form analogy draws from the members' broader experience. Examples of this level include:

- "sikaflex, it's the black sticky stuff that holds the windscreen of the car in place, you know it stays soft and doesn't go hard";
- "the communication cable, its about as thick as your thumb";
- "the windscreen wiper is trapezoid just like the ones on the Mercedes car and the washer sprays out of the arms like on those other European cars".

EVALUATION OF DATA

The role of analogy in the collaborative design process is not well documented in the literature (Dunbar and Schunn 1990; Hickman 1990). In research done to date on problem solving in scientific research teams two levels of analogy were identified. The first level of analogy relates to the use of examples drawn from the specific project. In the scientific context this would be the specific domain or experiment the research team is working on. The second level of analogy identified in the science research domain was when the scientist mapped the entire system of relationships from one domain to another, for instance, two domains being from distant classes which belonged to a subordinate category, e.g. phage viruses and retroviruses are mapped together (Dunbar 1994, 382).

The analogy used in design teams, for the purpose of creating shared understanding, proved a successful tool as often it was used when an initial communication where technical language, which is discipline specific, may not have achieved a successful outcome with designers from other disciplines.

Table 2, below, provides a breakdown of the percentage of times the team used the different communication strategies. It may appear a small percentage of time that Analogy was employed but in context there were

>14,000 design interactions equated to over 1200 instances where analogy of one type or another was employed in the effort to create shared understanding, it should be noted that most often two communication strategies were employed in parallel, so sketching was supported by technical language or one of the forms of analogy.

COMMUNICATION STRATEGIES	PERCENTAGE OF USE
Technical language	64.0%
Project analogy	2.8%
Domain analogy	3.3%
External analogy	3.0%
Gesture	2.3%
Sketch	5.6%
Prepared graphics	18.3%

Table 2: frequency of use of the communication strategies is shown in table.

To look at the success rate when analogy is used in design meetings provides an interesting insight to the design team activity. The success of analogy when used as the primary means of communicating in a design discussion is just under 60%, that does not sound overly effective when the total figure for effectiveness in gaining shared understanding is 84% but when put into the context of the range of communication strategies used it is one of the more effective strategies which involves a verbal only form of communication Typically when verbal communications strategies are used alone only 42% of the communications are understood ,so of the verbal only strategies the analogy is comparatively successful in achieving shared understanding among the designers. Also drawn from the study is that there are a diversity of concepts requiring communication in a design team there is a great deal of complexity to these concepts and therefore there is a need for designers to have in their "communication resources" the ability to employ a broad range of communication strategies as simple technical descriptions will not provide designers with the diversity of strategies by which to communicate complex concepts.

As design educators there is a need to expose students to the complexity of a design team but also raise their awareness of the range of communication strategies, including how they can best support the attainment of among their design collaborators but also to stimulate creative thought as part of that process. We have found, on the contrary, that metaphor or analogy is persuasive in everyday life – not just in language but in thought and action. Our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature (Lakoff & Johnson, 1980, p 3.).

If we consider the preliminary part of this paper, which considered the complex and powerful communication form of analogy, metaphor as used in poetry and broadening the scope of understanding and in inspiring abstraction of thought, the third form of design communication of analogy provides and interesting context for the application of the techniques employed during the creative activity of the poet. We must consider the potential of employing enhanced linguistic techniques to increase the "palet" available to designers to support their endeavour of creating shared understanding among design team members. Also of consideration is the potential of broadening the scope of the concepts being considered and presenting them in a more thought provoking, engaging and stimulating form, which is a potential outcome of the application of informed language, which employs analogy as a part of the communication.

CONCLUSIONS AND CONSIDERATIONS

Lakoff & Johnson (1980, p 235.) provide an interesting insight into this form of communication in their statement:

'From the experientialist perspective, metaphor is a matter of the imaginative rationality. It permits an understanding of the experience in terms of another, creating coherence by virtue of imposing gestalts that are structured by natural dimensions of experience. New metaphors are capable of creating new understandings, and therefore new understandings, and therefore new realities. This should be obvious in the case of poetic metaphor, where language is the medium through which conceptual metaphors are created.'

Award-winning poet Judith Beveridge's (2008, p. xiv) observation that 'Poetry gives us a way of gaining a fuller sense of ourselves and others, a way of viewing the richness of experience, a way of discovering reality and identity anew… ' makes a case for the way in which an appreciation for poetic language can enhance and experientially broaden the understanding and social dynamics amongst a multi-discipline design team.

However, while we have presented the possibility of messages and communication exchanges being opened up and renewed through the use of poetic comparison, we also acknowledge that the use of metaphor and analogy may also distort or complicate a message when participants of design teams do not share the same interpretative frame for the associative language employed. When a person sending a message moves from a denotative to a connotative linguistic platform in an effort to be understood they are exponentially widening the subjective lens through which the message may be viewed. There is no guarantee that a more poetic re-figuring of an original message will result in greater clarity or comprehension. The accuracy of any message may in fact be unintentionally destabilised by the diversity and personal contexts of the group members involved. For example, cultural backgrounds, values,

beliefs, social status, gender, specialised knowledge and sexual orientation may inform the way in which any message may be (mis) interpreted.

Rather than communication being perceived as a seamless transfer of information, ultimately the creation of shared comprehension is by necessity a dynamic, continuous and adaptive process where group members provide feedback and then pragmatically (or at times poetically) adjust or renew a message as a way of (re) negotiating and affecting a more precise understanding. This exchange may happen multiple times and alternate between denotative and connotative language in the refining process of the multi-disciplinary design team getting the 'world'—that is their commercial project—'right.'

So to bring this all together, language used by designers takes many forms, from the purely technical to the abstract concepts of metaphor and analogy. From the analysis and thousands of design team interactions it is possible to see the type of language used and its effectiveness. What needs to be considered though is how effective forms of language are in stimulating creativity. The language forms of analogy and metaphor at fundamental to the poet for creating images in the mind and to take the reader to a place that normal narrative cannot. So the question needs to be asked, could designers utilise these forms of language to both create the stepping stones to achieving understanding but they may also stimulate more creative thinking.

Should the enhancement of language skills be for the consideration of design educators and they design the curriculum of their students. The place of graphic form has long held its place in the design curriculum, but the question must be asked, is there a place for the literary form of language?

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