DESIGN SPEECH ACTS. "HOW TO DO THINGS WITH WORDS" IN VIRTUAL COMMUNITIES[1]

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Abstract

Cyberspace is language based (Cicognani, 1996; Cicognani, 1997; Winograd and Flores, 1986), and so are Virtual Communities (VCs). We propose that VCs are ideal places to experience and enhance a language for design. Design in a VC can actually be performed using speech acts that in-real-life wouldn't perform any design. We call these acts 'design speech acts'. We present, as a starting point, a list of verbs which can be used in a VC for design and the implications of using these verbs to design cyberspace. We present a methodology for structuring and defining design speech acts, so that a language for design in a VC can be subsequently developed. We are developing a specific environment for a virtual community in which designers can articulate their needs and produce text-based design objects.

1. Introduction

Text-based realities are becoming a subject of study by a large variety of researchers. From studies of Computer Mediated Communication (CMC) to sociology of cyberspace, to cyberpolitics, to AI, many researchers share the view that Virtual Communities (VCs), and more generally Collaborative Virtual Environments (CVEs), have found legitimacy for applied research. Virtual Communities have a sense of place as well as being when they exist in cyberspace "cities" or "buildings" (eg LambdaMOO). The metaphor of buildings and rooms provides a strong basis for understanding, navigating, and communicating in cyberspace. We often think of the result of architectural design as the specification of drawings, schedules, and symbols that provide instructions for a builder (often not the designer) to construct the structure. We also think of computer-aided architectural design as facilitating the development of such specifications. A major difference in the design of cyberspace is that the specifications ARE the design, the designer is the builder. This difference means that a language for designing cyberspace needs to be expressive enough to carry the feeling as

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well as the structure of the places. We claim that computer-aided architectural design of cyberspace, being language-based, needs a language of design to complement the existing languages for communication and navigation.

Speech Acts (SA) are utterances which contain information needed to assert and perform actions, or, according to Austin "things that people do with words". Speech Act Verbs are verbs used in speech acts utterances, to perform actions. Several studies on speech acts have been conducted since the first apparition of Austin's book "How to do things with words" (Austin, 1962). In particular, Searle (Searle, 1969; Searle, 1971; Searle, 1976; Searle, 1991; Searle, Kiefer, and Bierwisch, 1980) has developed specific explanations on how speech acts and speech act verbs work and perform in natural language. Speech acts are used in everyday life in the form of, for instance, promising, wishing, booking, complaining, forgiving, and so on (Verschueren, 1977; Verschueren, 1980).

In this paper we apply the theory of Speech Acts to text-based Virtual Communities, such as MOOs (MUDs Object Oriented). This follows the research conducted in two different fields, linguistics and design, and joins the two with the vision of drafting a first language for design for and of the electronic space.

Firstly, we will introduce a brief framework to understand how this theory is presented by its first authors (Austin and Searle), and why and how we intend to apply it to VCs. We intend to push the theory beyond the limits of computer languages and abstractions, and beyond some already seen applications of design of programming languages which use speech act theory and natural language interpreters.

Secondly, we will present some examples of Design Speech Acts, within a Dictionary of Design Speech Acts, which we give to students to solve design tasks (and, in a near future, professional designers). We also sustain and develop the idea that "how to do things with words" in a VC can be formulated into "how to design with words."

Finally, we discuss the considerations on the subject of improving and implementing research in this field of text-based virtual realities and design. We are particularly interested to explore possibilities of designing electronic space using text-based linguistic interfaces.

It is intuitive to think about programming language as a performative one. A sequence of commands can make computers "do things with words", literally. The programming language stands between the user and the machine, in such a way that they both can react and interact using the common language. Part of this language can be considered the "structure," or what that language allows to be recorded; and another the "content," or what has been recorded. A set of macros (groups of instructions which facilitate the execution of a command) can help designers to model and reproduce their ideas in a CAD system (content). This set of macros is called metalanguage (Wierzbicka, 1987). The structure of metalanguage in Virtual Communities underlies and supports the possibilities of performing actions. This language is, on the one hand, a programming language, with which the software is able to run and handle the interface; on the other hand, it constitutes the content and the substance of the interaction among users and the interface.

Our goal in this paper is to show:

- how and why speech act theory can be applied to text-based VCs;
- why the electronic space (also called cyberspace, in this paper) can be considered language based;

- how and why a language for design can be created in a VC;
- how such an approach can combine the function and the appearance of the designed objects;
- our choice of Design Speech Acts to be applied to a particular VC (MOO).

For this purpose we introduce a terminology and a point of view about design which may have more in common with linguistics and philosophical theories than GUI or CAD system design approaches. In this paper we do not consider CAD systems interfaces as relevant in the definition of design speech acts in a text-based VC. We recognise that recent developments in CAD and GUI interfaces include the use of natural language in a computer environment. We also recognise that CAD systems focus on the specification of the appearance of the design and lack an intrinsic means of creating a correspondence between the appearance and the functionality of the design.

In other words, the CAD tools create objects which remain graphical metaphors of real-life objects--they need to acquire physical form before being used--whereas design speech acts create at the same time the object appearance and its functionality. Objects designed using CAD systems belong to the metaphor of the interface. In a text-based virtual reality, such as a MOO, the correspondence between the appearance of the object designed and its functionality is complete.

It is beyond the scope of this paper to give an exhaustive analytical review of the debate around speech acts, on a philosophical point of view, and their applications in computer programming. These are, however, of a primary interest both for the us and other researchers in the field.

2. Framework of Linguistic Theories

Linguistic theories address questions about the nature and use of language, its construction and syntax, its reference to 'real facts.' Among these questions, there have been some which interest us such as, "What kind of actions do we perform in language?" and "How does an utterance have meaning?" (Winograd and Flores, 1986) These questions and the resulting theories are relevant here because the use of a design language in a Virtual Community environment has the effect of performing actions that change the environment, and the "meaning" of the words in the language determine directly the effect on the environment. We will focus on Speech Act Theory as the basis for a linguistic theory.

John Austin (Austin, 1962) in his book "How to do things with words" is the first to introduce the idea of Speech Acts (SA), analysing the relationships between utterances and performance. Speech Acts usually appear in the first person, and use the simple present tense, indicative (I promise I'll come tomorrow). Speech Acts are not descriptive; instead they are pronounced to affect an actual situation; they usually do not refer to past events.

A speech act is the action performed by language to modify the state of the object on which the action is performed. It represents an action effectively fulfilled by a sentence:

- I name this ship the Queen Elizabeth
- I pronounce you husband and wife

Austin presents two kinds of utterances: *constative* and *performative*.

> "The *constative* utterance, under the name of statement, has the property of being true or false. The *performance* utterance, by contrast, can never be either: it has its own special job, it is used to perform an action. …
>
> To issue a *performative* utterance is to perform the action: I name this ship *Libertè,* I welcome you, I apologize. …
>
> The performative must be issued in a situation appropriate in all respects for the act in question: if the speaker is not in the conditions required for its performance (and there are many such conditions), then his utterance will be, as we call it in general, 'unhappy'." (pp.13-14)

The conditions of 'happiness' of performative utterances are important to state how and when utterances are valid, in a real situation. A performative utterance can be void, unhappy, in two ways: 1) the conditions in which the utterance is performed do not satisfy the requirements for the utterance to be successful (I baptize penguins); and 2) the utterance is issued *insincerely* (such as, I am not in the position to utter a certain sentence, but I do. "I fire you" without being in a position which allows me to do so). Also, it is possible that after the utterance is issued, there may be a "breach of commitment", where the speaker doesn't operate under the performance of the utterance.

Austin does not present his theory in a strict logical-symbolic way - such as, for instance, Wittgenstein does, with a definitive scheme to analyse each sentence. Instead, he works with examples of everyday language to show how performances can happen. He admits that the distinction between various kinds of utterances is not always clear, but he claims five general classes of performative verbs:

1. Verdictives, which give a finding or verdict
2. Exercitives, the exercise of a power or right
3. Commissives, which commit you to an action
4. Behabitives, expressing attitudes about social behavior
5. Expositives, which fit utterances into conversations

Searle (1965; 1979) criticises Austin's taxonomy of performative verbs and proposes an alternative taxonomy with the following categories:

1. Assertive: to commit the speaker to something's being the case, to the truth of the expressed proposition (eg I warn you that the bull is about to charge; It's cold here)
2. Directive: attempt by the speaker to get the hearer to do something (I warn you to stay away from my house!; Please give that to me)
3. Commissive: to commit the speaker to some future course of action (eg I promise that I'll come tomorrow; I promise to return)
4. Expressive: to express the psychological state specified in the sincerity condition about a state of affairs specified in the propositional content (eg. I thank you for paying me the money, I congratulate you on winning the race, I am sorry to hear that)
5. Declarations: successful performance guarantees that the propositional content and reality correspond to the world (if I successfully perform the act of appointing you the chairman, then you are the chairman; or "I declare: your employment is (hereby) terminated")

Other researchers have studied, criticised and applied Speech Act theory to both the analysis of natural spoken and written language, and formalisation into logical speech systems. (Auramaki, Lehtinen, and Lyytinen, 1988; Button, 1995; Croft, 1994; Fishman, 1971; Holdcroft, 1978; Hymes, 1962; Kearns, 1984; Longacre, 1976; Norrick, 1978; Rodden, 1993; Sadock, 1988; Stubbs, 1983; Tsohatzidis, 1994; Vanderveken, 1990; Verschueren, 1977; Verschueren, 1980; Wastell and White, 1993; Wierzbicka, 1985; Wierzbicka, 1987)

The Theory of Speech Acts has been applied, deeply analysed and criticised mainly within the boundaries of linguistic theories. The theory can be applied to natural language, to examine text and discover how the syntax places a Speech Act (SA) in one category. We propose the application of SA Theory to design tasks in text-based Virtual Communities, so that identifiable categories of performance would correspond to specific design acts, or as we call them, Design Speech Acts. We introduce an hypothesis for developing some classes of Design Speech Acts, based on the assumption that the correspondence between a speech performance that produces a design, and the resulting design represent at the same time its appearance and its function. We believe that the renewed strength of this application, against many other unsuccessful applications, has to be found in this correspondence (Button, 1995).

3. Speech Acts Verbs for Text-Based Virtual Communities

Text-Based Virtual Communities are online computer mediated communities in which users (also called players, or characters) interact using various commands and natural language. In this paper, when we refer to VCs, we intend these text-based VCs.

Communication in VCs has been (and is being) broadly studied by both linguists and researchers of Computer Mediated Communication (cf. Journal of Computer Mediated Communication), and by sociologists interested in finding relationships between the change of linguistic register and the cultural formations of the community (cf. Cherny, 1995). The CMC researchers have reported some interesting results on how and why online communities, and electronic communication, have developed a particular set of expressions (a register) characteristic of that medium. Others have demonstrated how the electronic space can be considered as language based (cf. Cicognani, 1997; Winograd and Flores, 1986). However, research on how SAs can produce design and, perhaps, architecture in an online community is still to be developed. We believe that a similar register for design can be developed using SAs. We deal here with a particular kind of Virtual Communities called MOOs. This acronym comes from MUDs (Multi User Dungeons) which are virtual environments in which players chat, build objects, leave traces of their presence. MOOs are MUDs Object Oriented, from the characteristic of their programming language. This choice does not restrict the application of speech act theory to MUDs more in general.

Speech Acts are performed by speech act verbs. As seen above, in English some verbs can be considered performatives (eg. promise, permit, declare, inform), whereas others cannot (eg. walk, laugh, dress, open). We may say that the latter are simply 'descriptive' of a situation: 'I walk home,' for instance, describes the condition of me moving on my feet to go home. The performance is such only when the utterance produces a change of a real situation, when it affects reality in some forms. In-real-life if I say: "Open the door," unless I am giving order to someone (in which case the sentence

means: “I order you to open the door”), the door remains closed. In a VC, I may be able to open the door simply typing the command “Open door.” We believe that beyond the communicative aspect of SAs in a Virtual Community (such as ‘I cheer you’ or ‘I promise), there is a further aspect of performance in verbs like open, close, walk, take, drop, go, and so on, which affect the virtual reality as much as Speech Acts - intended in Austin’s way as communicative acts - affect reality. On the contrary, we think the SAs as known lose (partially or totally) their force and significance when uttered in a VC. For instance, ‘I promise I’ll be in the MOO tomorrow’ is a performative SA which has more to do with an in-real-life situation rather than a MOO one. This distinction is relevant when we try to define categories of Speech Acts in VCs.

We can group verbs in Virtual Communities which may not be considered performatives in spoken language, but they are in virtual environments. Verbs such as open, close, lift, move, are performatives in a text-based VC. We propose here categories of classification for Speech Acts in a text-based Virtual Community. The following categories group some of the basic commands of a MOO. These verbs are part of the database of an experimental MOO (StudioMOO) that the authors are using as support for research activities and education, which derives from the LambdaCore Database. Some categories of classification for commands which issued in a MOO perform actions are:

- communication (say, whisper, emote, page, think, etc.)
- navigation (go, teleport, move, etc.)
- manipulation (open, close, move, give, take, drop, lock, etc.)
- design (create, dig, recycle)

These categories identify four different types of actions in a VC. The communication acts are developed to provide flexibility and expressiveness in text-based communication that mimics the gestures and body language that are used in speech-based communication. The navigation acts provide alternative ways and modes of moving around the VC environment. The manipulation acts allow the user to do things with (and on) the objects in the VC. The design acts are less developed than the other three categories, since so far the emphasis has been on effective interaction with other objects/people in the VC rather than in the design of the VC.

The speech acts in the communication category (say, whisper, etc.) do not take into consideration the performative SA verbs as considered by Austin (such as promise, book, order, and so on). For example, a player issues the following command:

say Hello! I am here, or
say I call this room my Office

In this case ‘I am here’ and ‘I call this room my Office’ are the content of the message and not the SA itself. These may not be considered Speech Acts in a VC for the VC’s sake, but they may be SAs with reference to the ‘outside’ (or real life). This distinction is carried through all the categories of speech acts in a VC. The navigation verbs effectively move the user around the space, where the equivalent statement in real life may only be a description of an intention. The manipulation verbs in a VC actually make changes to the object they refer to, again in real life they may only describe an action. The design verbs make changes to the environment, effectively allowing the use of language to include both the specification and the “making” of the design.

4. Classification of Design Speech Act Verbs in VCs

Now we look more carefully at the category of Design Speech Acts in a VC. We first present the verbs that are currently available in VCs that fit in the category of design speech acts, then we look at what is possible. We propose a set of verbs and their classification as categories within the design speech act category as a means of improving the expressiveness of a designer in a VC.

The current LambdaCore Database (the basis from which we started our examination) has very few design verbs. Strictly speaking, there are only two: @create and @dig (the '@' is a syntax required by the software). The @create verb clones any specified 'fertile' object in the MOO. The @dig verb is a specialisation of the @create verb and it is used to create rooms with exits and entrances. The manual assignment of properties (using @set for example) and the programming of new verbs extend the ability to design using the current database 'Designing' means 'changing properties' in a MOO, similar in a way to real life situations where designing is planning the changes of matter, from one status to the other. To design a room using the current database, the specification is:

@dig in|out to anna's office

The room can only be specified as having a name for the room object and names for the entrance and exit. Further elaboration on the design of the room requires the use of the @describe verb.

We have selected some verbs from an English dictionary which are suitable for a designer to perform Design Speech Acts in a text-based Virtual Community. The selected verbs describe several aspects of design, not just the 'creative/programming' part, but also the description, use, organisation, and analysis of the design. The initial dictionary counted more than 17,000 words (not only verbs); we selected about 700 verbs that we can group into the following:

manipulative verbs

- model; verbs which assign shape properties (fold, append, paint, cut)
- create; verbs which literally clone objects and place them in the environment (create, build, construct)
- destroy; verbs which literally destroy objects previously created (blow, explode, crash, recycle)
- change; verbs which modify directly characteristics and properties (elaborate, stretch, scale)
- move; verbs for positioning objects or parts of them in the environment (lift, suspend, raise)
- activate; verbs dealing with the use of the object which change their properties (start, stop, switch)
- copy; duplicating verbs (clone, imitate)
- clear; verbs to assign default properties to objects (wipe, clean)

descriptive verbs

- specify; verbs which assign special characteristics and properties (compare, denote)
- describe; textual description of the object (comment, label, state)
- set or assign; to set attributes

analytic verbs

- organise; verbs which are intended for the organisation (such as the position or the locks) of objects in the virtual environment (plan, combine)
- calculate; evaluating verbs, of help while designing (measure, count)

- associate; verbs which lock objects with other objects (arrange, attract)
- select and search; verbs which help the designers during the creation and modification of properties

The verbs proposed affect one or more properties of a particular object. The above groups are what we understand being relevant for a designer to work in a VC. These verbs are not yet covering all the aspects of design in VCs, neither they are exclusive, and some of them may be considered matching equal functions (eg. change and specify, organise and associate). Each of these groups includes verbs which are of a similar nature, or synonyms. This reflects the nature of MOOs, which makes coincident the function (and functionality of an object) and its appearance.

We can imagine, for instance:

@scale table to <value>

or

@calculate area of kitchen

In the first example, the <value> may also be a verbal description, such as "big" or "bigger" so that a relative dimension is specified. The second example is about an evaluation of the object kitchen which could be useful to the designer.

In real life, performative Speech Acts only need to be pronounced to perform. In a MOO, SA verbs need to be programmed to affect other cells of data (properties), reiteratively calling other verbs, in order to modify the environment. It is like saying that in-real-life performatives change some properties when uttered. For instance, pronouncing someone man and wife, means changing their civil status. Similarly, SAs in a MOO will change specific properties.

It is relevant to note that, as appearance and functionality are coincident in the MOO environment, it is possible for design speech acts to create and describe, with a single action, MOO objects. We believe that a further step in the application of SA Theory can be taken: from the interpretation of the natural language content - as for CMC, to the application of that content for the creation/design of a virtual environment. The analysis of the content, in the case of design SAs, is no more a strict question of linguistic logic, which has demonstrated weaknesses and discrepancies. (Suchman, 1994; Winograd, 1994)

5. Discussion

Speech Act theory can be applied to text-based virtual environments so that design can be facilitated. The background of this application has to be found in the linguistic nature of electronic space. The performance of a command issued in such environments affects specific properties of the "virtual objects." Beyond the communicative content of the commands issued, a design dictionary of Design Speech Act verbs can be defined. We have presented some categories of how these design verbs can be applied in the construction of a design language in a MOO.

In this paper, we have deliberately left out two fundamental aspects of Speech Act Theory, as developed by Searle: meaning and intentionality. (Searle, 1989) According to Searle, the manifestation of the intention of performing an act, is enough for that act to be performed. Moreover, he proposes intentionality as a characteristic to group some SA verbs. SA verbs alone, even though categorised as performatives, may not reach the

performance attributed if intentionality by the speaker is missing. Meaning is related to the situation in which the utterance is issued, and to the interpretation by the hearer(s). Design speech acts as proposed do not take in consideration that, for instance, '@create wall' has other meaning a part from creating a MOO object called wall, with special characteristic. We argue that it is probably at this stage that SA theory finds its strength and validity when applied to text-based VCs. We have not entered the debate about interpretation issues, but we understand these as starting points for a discussion.

Another problem encountered is that there are commands (MOO acts) which we cannot classify into any of the MOO categories (communication, manipulation, navigation, design) or the proposed design ones (manipulative, descriptive, analytic), such as '@describe.' In section 4, we have classified the verb 'describe' as a design verb, but it might as well considered a communication one. When a player examines an object (@examine) the textual description of that object is displayed. This is, indeed, part of the communicative aspect. We are aware of the complexity of the classification, in-real-life, of Speech Acts, and we consider Design Speech Acts at least of the same complexity.

Finally, it is relevant to note that, as it is somehow impossible to separate the design from the communication aspect, the interface which supports design SAs in a MOO has a double-faced direction: toward the designer's communicative skills, and his planning ones. The reduction of design skills to linguistic ones might create solutions which only reflect the complexity of a language-based interface.

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