

Vendmaster

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Vendmaster is an augmented candy machine that taps into the ubiquitous culture of vending to create an alternative stage, an unusual encounter between a machine and a human user to play a language game in public. Vendmaster addresses the lack of ability to put ourselves into the perspectives of others. The game highlights the experience of non-native speakers who struggle to speak the language of the other in their everyday. Here, I discuss Vendmaster's role as a machine that makes a social and political commentary on the use of language in establishing boundaries among people and articulate on the different experiences of language in the city discussed in relation to Bourdieu's notion of linguistic capital and Wittgenstein's language games.

1.0 Introduction

The culture of automated merchandising is an important part of the urban fabric mediating the economics of globalization. As the familiar, yet mute interface of the vending machinery delivers more and more products, we witness a subtle yet inevitable trade-off between convenience and the standardization of experience.

This paper discusses Vendmaster, an augmented candy dispenser that taps into the culture of standardization to perform a social commentary on the role of language in establishing boundaries between natives and non-natives speakers (Photo 1-2). Vendmaster disrupts the daily routine of a vending machine and hijacks its familiar interface to raise a fundamental question about our assumptions of each other; the lack of ability to put ourselves into the perspectives of others and especially expose the limits of our understanding of each other's struggle with language.

Vendmaster plays a game. Users on their way to purchase candy are interrupted with a question coming from the machine asking them to speak the name of the candy brand in the local accent of a non-native speaker (e.g., pronouncing Skittles® with an Indian accent). As English speakers try their chances to mimic Korean, German and Indian accents, depending on their desired candy flavor, Vendmaster records their voices and runs real-time speech analysis and recognition algorithms to evaluate how closely their voices match to the pre-recorded voice samples for each flavor.

After each try, Vendmaster comments on their performance:

“Did you say Skittles®? Hmm, not like that. I said ‘Skiiiiittleees,’ try again please...”
Or “Yes, good it is getting better, one more time please...”

While users who demonstrate the ability to speak closely like the non-native’s speaker are rewarded with a special candy (e.g., an actual bag of Skittles® that is sold in a vending machine in India), the unsuccessful ones, after five tries, are given their money back and encouraged to play again.

The paper is organized as follows: The backdrop of automated merchandizing, the public space and the city are introduced as the stage for Vendmaster’s *mise-en-scène*, where the culture of vending, standardization and the automated merchandizing form the basis of the everyday narrative, dramatized by Vendmaster’s language game. The game is discussed with conceptual references to Bourdieu’s notion of “Linguistic capital” and Wittgenstein’s language games, which brings into attention the way language is used in mediating hierarchy and class differences. By looking closely at the relationship between natives, non-natives and the machine speaker, Vendmaster is presented as a machine that goes beyond its prescribed role within the labor economy of automated merchandizing to take social, cultural and political responsibilities during its mode of production.



Photo 1-2. Vendmaster

2.0 The Stage

Since the first known coin-operated machine used for dispensing postcards in England during 1880s, the culture of automated merchandising machines, modeled on a paradigm of asynchronous trade in public, went into many iterations from selling confectionaries to cigarettes and fresh lobsters.

With an annual trade capacity reported as high as \$40 billion per year, the culture of automated merchandizing is everywhere from common public spaces such as movie theaters, airports, train stations and bus terminals to movies; putting the vending interface into the backdrop of everyday (Smart Card Alliance).

As vending machines take major roles in the dissemination of goods to foreign markets and public places, consumers purchase global products with minimum interaction with others. By trading off the standardized, impersonal experience of the merchandizing with the convenience of being able to remain quiet during the purchase, the automated merchandizing becomes an outlook for those who prefer not to speak or rather struggle through the need to speak in the language of the other.

Therefore it is not surprising to observe how vending machines immediately became quite popular in metropolitan areas with high immigrant population where the language barrier could be transcended with a machine that could deliver food without the need for interpersonal communication (Gumballs).

By drawing a parallel between the consumption of standardized foods, global brands and the use of language, it is not that difficult to observe the emergence of an urban monoculture that is increasingly dominating the daily experience. The challenge lies in remaining responsive to the struggle experienced by those who do not look, speak or behave like us. Thus, Vendmaster intends to expose the limits of our understanding and give us a chance to reverse roles and exchange perspectives to make each party more aware of each other.

3.0 The Actors

Vendmaster's *mis-en-scène* is staged as a performance between the user and the machine, a native and non-native or a local and an immigrant in their different encounters with their 'other.' By simply challenging the player to think about how it would actually feel to speak a word in an unfamiliar way (like the non-native's experience), the play intends to identify the linguistic struggle against two parties; presented both as a 'technical' challenge where it is observed as a capacity to mimic and change one's voice in relation to the other; and a 'social' one, which is reflected as the willingness to give up one's privileged position of being the native to become the other, non-native or the minority in that culture.

Vendmaster creates a context, a game where three actors (the recorded speaker, the player and the vending machine itself) play their roles to make a statement about 'otherness', where the difference between the native and the foreigner, the machine and the human and their capacity to 'understand' each other is explored in parallel. The capacity to understand is an act of recognition of the status of the other, in which the goal is to use the brand names of the candies as tokens of exchange to recognize and become aware of each other's use of language. While individual candy names do not have a significant contribution to this exchange, the subtle differences in their pronunciation caused by accent, intonation or by simply because of the individual speech characteristics of a non-native speaker, show us how language creates both the possibility as well as the limit of 'recognition'.

Vendmaster proposes a computational, political and social negotiation process among the parties, where language becomes the site of confrontation for the recognition of each other. Being foreign to both parties, Vendmaster's technology serves to the process as its computational capabilities facilitate the game, communicate the linguistic struggle and reflect on the politics of language. The natives of a language who are used to interact only with their kinds and have limited experiences with different uses of language show less

tolerance to those who cannot speak like them. As Vendmaster disrupts the daily routine, it asks the locals switch roles and enjoy the experience of the world from the perspective of the other.

4.0 The Language

In Bourdieu's terms, this is a struggle for the "linguistic capital" (Bourdieu 1990). While 'Skittles[®]', Mike and Ike[®] or Hot Tamales[®]', do not have much linguistic significance, in the culture of trade, communication and exchange, they represent a value that is mediated between the speakers. The ability or disability to pronounce Skittles[®] in a particular way stands for a form of literacy. As the word lies at the very border, the ability to speak it 'like the other' functions like having a 'pass', a legitimate access to the other's world. However, as users learn more about how to mimic the pronunciation of the words to pass their language test, they are also alienated from their own language. They speak a language that doesn't belong to either party, but is mimicked and negotiated on the fly. Thus, this unfamiliar language becomes a gateway for the machine to learn about its other, the human; extending its history of sounds that corresponds to the ways to recognize these particular words: 'Skittles[®]', Mike and Ike[®], Hot Tamales[®] in different accents.

Bourdieu traces many links between the standardization of the use of language and higher level economic goals shaped by social processes (e.g., to a desire for the unification of labor market). "The normalized language is capable of functioning outside the constraints and without the assistance of the situation, and is suitable for transmitting and decoding by any sender and receiver, who may know nothing of one another" (Bourdieu 2001, 48). Like the normalization of the language, the normalization of labor with the use of automated machinery yields impersonal and anonymous modes of production. Hence, retracing the relationships between standardized languages and automated merchandizing, Vendmaster's language game is embedded in a vending machine, a cultural artifact that is at the heart of impersonal exchange economics.

Making the players actually aware of whom the producer of the candy is, or where it actually came from, is an important sub-message to be able to redraw the parallels between globalization and standardization of food and language. Attributing a sense of locality, authenticity and 'origin'ality to the candies (e.g., by making local versions of global brands) was an important design decision for this project to be able to project a sense of exoticism and exclusivity to the candies where they signify as if they worth more for being from another country. Hot Tamales[®] from India, deserves a struggle, a little more effort than getting your average candy from the dispenser. As original candies map onto the accents of the speakers they become the symbols of difference, and tokens of exchange in mediating otherness within language (Figure 1).



Figure 1. Sticker designs for the candy machine: Korean Skittles[®], German Mike and Ike[®] and Indian Hot Tamales[®].

1.1. Language Game and Linguistic Capital

From Wittgenstein's 'language game' played among stone builders to Steels' computational 'naming game' for software agents (Steels 1997), a number of philosophers and scientists investigated linguistic, computational and philosophical models to describe the human and machine language acquisition as a game that functions like a negotiation process to construct both the vocabulary and its meaning from the interaction of its players.

In "Philosophical Investigations", Wittgenstein brings forth the arbitrariness of the sign and its capacity to mediate relationships by giving a simple example:

(2) Let us imagine a language ...The language is meant to serve for communication between a builder A and an assistant B. A is building with building-stones; there are blocks, pillars, slabs and beams. B has to pass the stones, and that in the order in which A needs them. For this purpose they use a language consisting of the words 'block', 'pillar', 'slab', 'beam'. A calls them out; --B brings the stone which he has learnt to bring at such-and-such a call. -- Conceive of this as a complete primitive language (Wittgenstein 2001, 3e)

Learning a language therefore translates into learning the other's way of using the lexicon.

(7) In the practice of the use of language (2) one party calls out the words, the other acts on them. In instruction in the language the following process will occur: the learner names the objects; that is, he utters the word when the teacher points to the stone.--And there will be this still simpler exercise: the pupil repeats the words after the teacher--both of these being processes resembling language.

[...] We can also think of the whole process of using words in (2) as one of those games by means of which children learn their native language. I will call these games 'language-games' and will sometimes speak of a primitive language as a language-game.

[...] And the processes of naming the stones and of repeating words after someone might also be called language-games. Think of much of the use of words in games like ring-a-ring-a-roses (Wittgenstein 2001, 4e).

Following Wittgenstein's line of thinking, the language game played by Vendmaster is also a negotiation game; not of meaning, but of sounds mediated by candy names. The mastery lies in identifying the other's relation to language, thus the capacity to utter the right sound at the right time defines the currency of exchange.

For the recorded human speaker (the voice of Vendmaster) and the player, the struggle is for "linguistic capital (Bourdieu 1990)." The ability to speak like the other, for Bourdieu, is inherently a political struggle. It operates within a value system, which establishes the boundary between insiders and outsiders, natives and non-natives and their capacity or limit to transcend them.

The conflict between the French of the revolutionary intelligentsia and the dialects or patois was a struggle for symbolic power in which what was at stake was the formation and re-formation of mental structures. In short, it was not only a question of communicating but gaining recognition for a new language of authority, with its political vocabulary, its terms of address and reference, its metaphors, its euphemisms and the representation of the social world which it conveys, and which, because it is linked to the new interests of new groups, is inexpressible in the local idioms shaped by usages linked to the specific interests of peasant groups (Bourdieu 1990, 48).

Bourdieu highlights the use of language in establishing class differences especially when the process of “linguistic purification” provides upper classes a “de facto monopoly of political power” to establish a national ‘official’ language that privileges those with the linguistic competence over the others (Bourdieu 1991). Therefore the use of teaching material (e.g. grammar books, dictionaries... etc.) for the official language serves to a process of ‘legitimization’ of the dominant one and the “normalization” of the others to fit into the standards of the system

In Vendmaster’s language game, for example, to be able to pronounce Skittles® the way the other poses a challenge and questions the dispositions the players have in their encounter with unfamiliar situations. In Bourdieu terms, the game addresses the “habitus,” the set of perceptions, practices and attitudes that determine the player’s reactions and tries to act on these dispositions to reorient their actions and inclinations towards others (Bourdieu 1991). While there is no correct or best way to say this arbitrary word, the ability to mimic the recorded speaker is the only way to succeed in the game and get the candy. The currency here is not only an economic one: it is not the quarter that turns the knob for the candy dispensing mechanism, but the ability of the player to mimic the non-native accent, to adapt to the other’s voice and speak like the other is at stake.

For a native English speaker, it is time to make an attempt to pronounce the word like a Korean, German or Indian. While it is an everyday reality for the non-native speaker to try to speak like a native, for the local, the challenge to speak like someone else is perhaps a first time experience. The referee, the witness of the process, is the candy machine, an ‘other’ to both parties. While it knows nothing about the human player and the reference native speaker, neither the meaning of the spoken word nor the context of the interaction, it basically does one task well: it ‘blindly’ compares the acoustic characteristics of the pre-recorded voice with the players’ and scores them based on their closeness to the reference.

5.0 The Design of Vendmaster

1.1. Interaction Design

As players deposit twenty five cents and turn the knob for their specific candy, mechanical switches detect which candy dispenser is activated and loads the related speaker profile to initiate the game (Photo 3). The system asks the player to pronounce the brand name exactly the way it does in his/her local accent. As the player speaks to the microphone, his/her voice gets recorded and analyzed in real-time to evaluate how much it matches with the pre-recorded sample. At each try, the machine plays back what has been recorded and analyzes the data while the players can listen the way they sound (while mimicking the voice of another person). After each try, Vendmaster comments on their performance:

‘Did you say Skittles®? Hmm, not like that. I said [Skiitttlees], try again please...’

If the player succeeds within four trials, the machine rewards him/her with the candy. A successful game therefore makes the computer trigger the motor drivers and open the related dispensing mechanism to output candy. Unsuccessful users are encouraged to play again, as the machine, dispenses their quarter back.

After each try, Vendmaster archives the different ways to pronounce same phrase (e.g., Skitiitleeesssss) to improve its recognition capability. It computationally learns (with custom machine learning techniques) to recognize the phrases better and gradually used them build an experience to “teach” the user how to perform better:

“Yes, good it is getting better, one more time please...”

“Or, much better, say it again...”

Here, the (limited) capacity to ‘learn’ and ‘teach’ is the underlying ‘intelligence’ used for facilitating a more enthusiastic gameplay. Users soon recognize that they are not engaging with a regular candy dispenser. The communication of this ‘intelligence’ helps users accept its challenge and confront with its other to pass the language test. As the game intends to reverse the social hierarchy between the native and the non-native, evaluator and the evaluated, the machine takes the responsibility to demonstrate a capacity to act like a human at least for recognizing, analyzing and evaluating human speech.

As the machine generates real-time feedback for its players (by commenting on their performance), it tries to form an intimate relationship with its users and uses a number of ways to communicate the intelligence by sounding like a human. The candy dispenser (while literally speaking with the voice of the pre-recorded speaker) engages with the player as if it is human.



Photo 3. User interacting with Vendmaster.

The responses given by the machine are characterized by the player’s performance. The selected responses directly correspond to how good or bad they do in the game. For example, the recognition of two consecutive failures makes a stronger comment on the failure: “No, no, no, no, no.... I said Hot Tamales. Again please!

“A third one even sounds worse: “Noooooooooooooooooooo”, I said “Hot Tamales” aren’t you getting it?”

While the machine chooses the responses from a set of pre-recorded samples, depending on the quantified success rate, it responds in different moods for different performances. One notices the human temper, wittiness or sarcasm in the voice; simple but strong social cues just to render the machine as if it were human, again, only in the eye of the beholder.

1.2. Physical Design

The physical design of Vendmaster is based on a commercially available candy dispenser “Vendstar 3000,” which is augmented with a computer, microphone and custom electronics (Vendstar). The original design of the Vendstar is modified to have coin sensing and motor-controlled candy dispense mechanisms that allows the system give out candy based on the results of the gameplay. See Photo 4 for construction and Figure 2 for the system operation details.

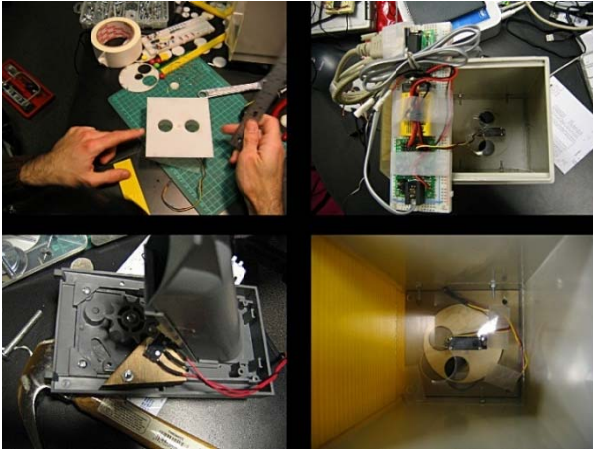


Photo 4. The re-engineering of the internal mechanics of the dispensing units allows the dispenser hold the money and candy until the user wins the game.

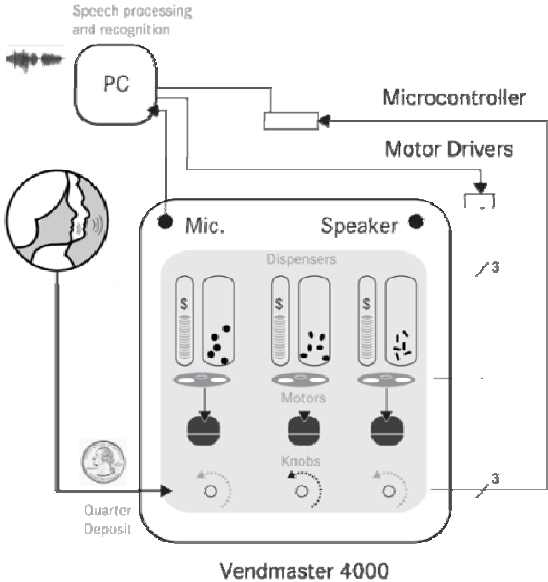


Figure 2. Diagram showing how Vendmaster works.

The system runs custom software to capture input from a built-in microphone, where the recorded files are processed with pattern matching, learning and decision making algorithms throughout the different stages of the game. Pre-recorded audio from native Korean, Indian and German speakers are used to guide the user and give feedback during the interaction.

6.0 Conclusion

Machines can become critical tools that would interrogate more subtle values such as the “communicative needs of the alienated, traumatized, and silenced residents of today's cities (Wodiczko 1999).”

In similar vein, Vendmaster intends to communicate suppressed differences and bring into attention the silence of ‘otherness.’ Under the camouflage of the candy dispenser, it tries to vocalize the voice of other, the non-native who struggles within the dominant language of the native. While reversing the roles, from the oppressor to the oppressed, it not only intends to create more encounters with others to allow the problem surface more in the consciousness of its players, but also expose the richness and complexity of the experience of the everyday that is often compromised by the convenience of standardization.

Within the ubiquitous culture of vending, standardized food and language, my intention is to set Vendmaster as an intelligent reminder; a critical machine that can contribute to the machine culture with more artistic, social, cultural and political responsibilities.

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