Exploring Boundaries as Information:  
Michael Polanyi’s Concept of Dual Control  

(A rough draft)

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Abstract:

The terrorist attacks on September 11, 2001 dramatically affected the work of public administrators at all levels in the United States. Yet, none were more dramatically affected than those working the borders of the United States. Not only did the number of rules, regulations, and workers swell, but the borders, themselves, were extended, both physically (to the bodies of individuals) and socially (to interpersonal relations).

A border is the outer boundary of some entity, but boundaries can also divide the same entity into subunits. What defines a boundary is its ability to separate and divide; what distinguishes a border is its frame of reference. Theories exist within a set of boundary assumptions and constraints, and boundaries can provide meaning to concepts and define the conditions of a setting. Clearly, borders and boundaries apply to more than the imaginary line dividing two countries.

It is the purpose of this paper to explore the implications for public administration of understanding boundaries as Michael Polanyi did. Polanyi distinguished between test-tube type boundaries, that provide a passive border that encloses the item or items of interest, and machine type boundaries, that become the item of interest. Both types of boundaries exhibit two levels of structure and control, but the focus of attention changes from the contents to the boundary conditions, themselves. As attention is focused on the boundary conditions, one finds amazing possibilities. Polanyi, himself, describes how machines, strategies, DNA, and language all function as boundary conditions that exhibit new principles of structure and control and, consequently, new information. What implications does Polanyi’s understanding have for border management in a post-911 world? Does his understanding of boundaries have implications for other domains of public administration? Are Polanyi’s ideas still relevant to public administrators today?
“Humans, on the other hand, have a knack for taking a verb that is alive and full of grace and turning it into a dead noun or principle that reeks of rules – then something growing and alive dies. Nouns exist because there is a created universe and physical reality, but if the universe is only a mass of nouns, it is dead. ... For something to move from death to life, you must introduce something living and moving into the mix ... nouns with movement and experience buried inside them: the ability to respond and expect.” (Young, 2007, pp. 206-207)

Modern science disclaims any intention of understanding the hidden nature of things; its philosophy condemns any such endeavour as vague, misleading and altogether unscientific. (Polanyi, 1959, p. 20)

I begin with theory. In “Life’s Irreducible Structure” (1969/1968), Michael Polanyi describes a theory of boundaries that is important for two insights that will be addressed in this paper. The first of these is the concept of dual control - which implies a “hierarchical” view of the world. In a hierarchical order subject to dual control, each entity is subject to the conditions which create it and to the conditions that control the subsidiary elements of which it is created. We will return to this concept shortly.

The second insight that Polanyi brings to light is the distinction between test-tube like boundaries and machine like boundaries. The former are boundary conditions that enclose and define. The latter are boundary conditions that elucidate and create. When we look at a test-tube, we rarely notice the tube (although a glass blower may do so). Our focus is on its contents, on the elements contained within the boundary conditions. Consider a drinking glass. The glass may contain a liquid of unknown composition. Now, consider the chemical elements silicon and oxygen. Imagine the combination of the two into silicon-dioxide. The glass, as it happens, is largely made of silicon dioxide - the manufacturer has defined boundary conditions for silicon dioxide that form it into a “tool” that becomes useful. That process, properly explained, can be fascinating, but was that your thought when I first described a drinking glass? I suspect that your focus was more likely on the contents of the glass or, for the rare individual, on the shape of glass. This is what Polanyi means by test-tube type boundary conditions. Such boundaries define the limits of something. They contain and control, but our focus is on the contents that are contained by the boundaries, not on the boundaries, themselves.

On the other hand, when we look at a machine, what we see is the machine, itself. Only a mechanic or an engineer will see the nuts and bolts, the o-rings, the resisters, the capacitors. When we
look at a computer, we care little for its components. True, there are some who dote over processor speeds and memory capacity, but even they rarely consider the silicon-dioxide that makes up the chips that allow the computer to function. With machine like boundary conditions, we care little for the components contained or controlled by the boundaries because it is the boundary conditions, themselves, that draw our attention. When we turn on a laptop computer, our focus is on the function of the machine rather than on its components. When we fire up a word processor, we are unconscious of the programming objects and subroutines that together make it functional. Rather, our focus is on the function that it provides, on the boundaries that define.

Both types of boundary conditions bring together elements that might otherwise remain apart. However, in each case our focus differs. In the case of the drinking glass - of test-tube type boundaries - our focus is on the contents. In the case of the laptop computer - of machine type boundaries - our focus is on the boundaries, themselves. Polanyi argues that, “By shifting our attention, we may sometimes change a boundary from one type to another.” (Polanyi, 1969/1968, p. 226) However, a shift in focus has important consequences. If we shift our attention from the contents of test-tube type boundaries to the boundary conditions, themselves, we must recognize a new principle at work, a principle that creates a unique entity no longer fully explained by an understanding of its underlying components. Likewise, if we shift our attention from the boundary conditions to the contents of those conditions, we immediately lose sight of the meaning created by the boundaries; they are reduced to simple extensions of their subsidiary elements. Machine type boundaries create new meaning for the components of which they are composed. Test-tube type boundaries focus our attention on the meaning of the elements bound and constrained rather than on the elements from which the boundaries are created. While machine type boundary conditions never completely lose sight of their subsidiary components, they can not be explained by the principles that control those components. Test-tube type boundary conditions, on the other hand, are fully explained by the principles controlling any underlying elements. Yes, it is possible to shift one’s focus, but the consequences of doing so are not trivial. When he introduces us to machine type boundaries, what Polanyi is describing is a structure within which we harness existing elements to compose new meaning; a method by which we impose boundary conditions to create new purpose. That structure, itself a set of boundary conditions, suggests interesting possibilities for understanding and using boundaries in public administration.

On September 11, 2001, the America that I knew died. Traveling through Europe as a child in the ‘60s, I pitied the European need to check passports at every border and, in countries like France, to carry identification papers at all times. I assured my friends in Zaire that we would never be arrested for
coming too close to the White House (as I was when approaching President Mobutu’s mansion in Gbadolite), nor would our security officials think twice about someone carrying a map near the border (for which I was accused of being a spy). But, I was wrong. Even before the catastrophe of 9-11 we Americans had begun to sacrifice our freedom for the sake of safety. Already, airport security had become stiffer. Already, barriers and walls had been erected around the White House. Yet, 9-11 was the tipping point. Concern for security that had been gradually building suddenly emptied in a flood of regulation and restriction. As a consequence, the borders of the United States became a focus of attention as never before.

In December of 2011 I traveled from Cleveland, Ohio, U.S.A. to Oaxaca City, Oaxaca, Mexico. To do so I crossed the border between the two nations and experienced, first hand, the consequence of an intensified security focus. However, in crossing that border, I did not simply cross an imaginary line from one imagined place into another. In northern Minnesota in the early ‘90s, I drove across such a border into Canada and then turned around and came back to the United States - without presenting papers or otherwise being recognized for my international travel. That is a test-tube type of boundary. It constrains or limits one set of elements from another to make organization of the elements more precise and manageable. That is not the way the United States treats its borders today. They have become machine type boundaries - a new entity that draws our attention and focuses it - even as we lose sight of the elements of which it is made. Gloria Anzaldúa describes it thus, “The U.S.-Mexican border es una berida abierta where the Third World grates against the first and bleeds. And before a scab forms it hemorrhages again, the lifeblood of two worlds merging to form a third country - a border culture. Borders are set up to define the places that are safe and unsafe, to distinguish us from them. A border is a dividing line, a narrow strip along a steep edge. A borderland is a vague and undetermined place created by the emotional residue of an unnatural boundary. It is in a constant state of transition.” (Anzaldúa, 2007/1987, p. 25) Anzaldúa distinguishes between a border and a borderland because she recognizes the difference between a test-tube type boundary and a machine type boundary. The former is a line that distinguishes us from them. The latter becomes a place created by emotional residue and constantly in transition.

What Anzaldúa describes, however, is the machine type boundary, the borderland, on the ground - where real people live and love and hate and fear. Crossing the border by air, I found myself in a completely different world. The moment I walked through the doors of Cleveland Hopkins airport, I had entered a new world, cut off from my home, my family, and my history - except by exceedingly thin threads of communication and memory. Marc Augé writes of such a space: “If a place can be defined as
relational, historical and concerned with identity, then a space which cannot be defined as relational, or historical, or concerned with identity will be a non-place.” (Augé, 2008/1995, p. 63) When I stepped through the airport doors, I crossed into a non-place from which I would eventually emerge - but in a different world. Cut off from my full identity, I became a person defined by passport, ticket stubs, baggage tags, and whatever I could carry on my body. The border crossing, itself, became an almost incidental part of the whole, for once I entered that non-place, I had become one with the machine - I was “living” within the machine type boundary that moved me from one world to another across a border/boundary that had become another incidental detail - along with so many others.

It may be helpful to relate in more detail the non-place life that I experienced on the way to Oaxaca, for it brought me face-to-face with the machine like nature of this non-place boundary between the United States and Mexico. This was no hemorrhaging scab, but a technical-rational (Adams and Balfour, 1998) creation of bureaucracies working collaboratively, and my first step was to check my suitcase. It weighted 50 pounds, plus or minus a half pound, and I did not have to pay for it because I had a credit card account that gave me one free bag. My wife, who had checked in earlier to help her parents with their own flight, had checked one free bag plus a second (full of Christmas gifts) for which she had to pay. Next, I made my way through “security”, showing passport and boarding pass, emptying my pockets, removing my shoes and coat, putting my handbags through the x-ray machine, and holding my hands over my head for a full body scan. Once past security, I phoned my wife who was almost back to our departure gate after having seen off her parents. There we waited until boarding time. There we slowly realized that something was wrong with our flight - that the pilot was ill and that no replacements were available. There my wife stood in line for an hour and a half waiting for an opportunity to talk to an agent who could reroute us, even as I paced the airport halls looking for another agent who was more readily available. There I finally pinned down an agent who could reschedule us and who confirmed the fact that we would miss our connecting flight to Oaxaca and that the next available seats were five days later. At the mercy of the technical machinery that powered the non-place within which we had chosen to live for a short while, we settled for flights to Mexico City, a hotel in Houston, and food vouchers for airport food concessions.

Having experienced one unanticipated aspect of the border-crossing non-place, our lives became subject to many more. We soon learned where we could find an Internet connection, which airport restaurants had food that appealed to us, and where we could watch the Browns football game. Upon arriving in Houston, we discovered the advantage of stopping at the gate upon exiting the airplane (where we were able to secure one seat on the next flight to Oaxaca), the disadvantage of trying to contact other
ticket agents after 10:00 pm, the difficulty of locating lost baggage (we had to claim my checked bag in Houston but we eventually found my wife’s bags in Oaxaca), and the shortness of a hotel stay in non-place. The following morning, we checked for Cheryl’s bags again, rechecked my bag, and passed through security - again with full body scan. Once through security we temporarily found a real place in the Houston airport when we met our son and daughter also on their way to Oaxaca but coming from Portland, Oregon and flying a different route. After enjoying a bite to eat together, our children headed to Toluca, I headed to Mexico City, and my wife began pacing the halls of Houston International Airport until her flight would leave in the evening. On the Houston to Mexico City flight I conversed with a young woman whose Texas based American family once drove to Cuernavaca each Christmas, but after staying home for a couple of years decided to brave the non-place of air travel, rather than the borderland on the ground.

At the Mexico City airport, I presented my passport without incident, received a green light at the customs desk, and proceeded to search for passage from Mexico City to Oaxaca City. Having officially crossed the border, both physically and legally, I was still locked within the air travel non-place but no longer able to effectively converse with those around me. I found my way to the Continental desk which directed me to the Aeromexico desk in the other terminal. Legally, I was not supposed to use the inter-terminal trains without a boarding pass, so I experienced another non-place boundary event - the exchange of currency. Pesos in hand, I began searching for a bus to the other terminal, but was directed back to the train and the guard, recognizing the confusion in my eyes, let me by. At the Aeromexico desk I was told I would need to stand in line for 45 minutes to receive a stand-by ticket so that I could wait in another line for an hour to discover whether there was space for me on one of their flights. Instead, I decided to spend the extra money to purchase a ticket on Viva Aerobus, so I boldly walked by the guard to the inter-terminal train once again and sat down to wait. Some 30 minutes later I noticed animated discussion and pointing among the other waiting passengers, concluded that the train had stopped running, and followed behind the small crowd down the hallway and down the elevator to a parking lot where a bus was waiting. Noting that some people were paying for the bus but some were not, I innocently joined the latter group and soon found myself on my way.

Back at the first terminal, I waited until I could purchase a ticket, waited again until I could check one of my hand bags (after some confusing conversation in Spanish and English), and then proceeded through security so that I could wait some more in front of a monitor that, several people assured me, would eventually show from which gate my flight would depart. When the monitor began to show flights that were to depart half an hour to an hour after my own, I began to be concerned, calculated which gates
were most likely to service my flight, and walked to those gates to see what I could find out. Told to return to the monitor to find out which gate would service my flight and unable to communicate more clearly, I began to retrace my steps, changed my mind, and returned to the gate that was, I thought, listed on my ticket. As in Cleveland, I refused to merely wait in line, to simply allow my person-hood to be completely drained from my body. When I returned to the alleged gate, there were people disembarking next door and a different agent was at “my” gate. This agent, too, directed me to the monitor, but while I tried to explain the fruitlessness of such an action, another agent walked by, spoke rapidly in Spanish, and I could tell that something had changed. “Just wait here”, I was told, and as I looked around at the other passengers who had gathered behind me, a bi-lingual passenger explained that my flight was to board from this gate. No longer worried that I would be stranded in Mexico City, I stepped back to wait with the other passengers.

My flight to Oaxaca City was uneventful, two of my sons picked me up at the airport, and I breathed a sigh of relief. However, my non-place experience was not completely over. Three hours later, my wife finally arrived from Houston and my sons and I watched, deaf and dumb behind a glass wall, while she went through security and attempted to locate our checked bags. Only my checked bag was delivered and she began, with the help of an English-speaking agent, to fill out a lost baggage report when, suddenly, she spotted her two bags sitting behind a counter where they had been placed the night before. Once she had all the bags we only had to wait for her to pass through customs. Clear of the cross-border, air travel non-place, we could finally, truly relax.

When we think of borders and boundaries, we generally think of them as simple lines separating two sets of entities. On one side of the boundary is “us” while on the other side is “them”. On one side lie the elements of interest and on the other side the elements of no concern. To a resident of Mead, Nebraska, the border between the United States and Mexico must seem like a test-tube type boundary, but let that resident fly to Mexico for vacation, and the border becomes altogether different; it becomes a non-place experience. What happens is that the border is transformed from a test-tube to a machine type boundary that is no longer incidental, but very powerful and very real. In 2012, an international boundary has become much, much more than an imaginary line that separates us from them. Today, an international border touches every aspect of our being, from our physical belongings, to our bodies, to our very emotions and well being. It has metamorphosed from something that we use to define and control others into something that controls us. By shifting our attention, we have turned a passive test-tube boundary into a active machine type one. Out of an imaginary line, we have created a tool that strips us of our history, our relationships, and our very identity.
According to Webster’s Ninth Collegiate Dictionary, a border is “1: an outer part or edge 2: boundary ... “, while a boundary is “something that indicates or fixes a limit or extent; specif : a bounding or separating line, point, or plane”. Dictionary.com, on the other hand, defines border as “1. the part or edge of a surface or area that forms its outer boundary. 2. the line that separates one country, state, province, etc., from another; frontier line: 3. the district or region that lies along the boundary line of another. 4. the frontier of civilization. 5. the border, a. the border between the U.S. and Mexico, especially along the Rio Grande, b. (in the British Isles) the region along the boundary between England and Scotland.” It defines boundary as “1. something that indicates bounds or limits; a limiting or bounding line. 2. Also called frontier.” A border, then, is an outer boundary, especially between nation states, while a boundary is a slightly more general term referring to something that indicates or defines a limit or extent. In other words, a border is a boundary at the edge of some entity, while boundaries can also divide the same entity into subunits. What defines a boundary is its ability to separate and divide; what distinguishes a border is its frame of reference. Clearly, borders and boundaries apply to more than the imaginary line dividing two countries.

Within organizational theory, boundaries are used in a variety of ways. For example, Samuel Bacharach writes that “A theory is a statement of relations among concepts within a set of boundary assumptions and constraints.” (Bacharach, 2005/1989, p. 165, italics added) Here we see contextual assumptions acting as boundaries to constrain theories. Similarly, Abraham Kaplan writes, “If research is about theory improvement, then it behooves us to be as clear as possible about the theories guiding our research and the perspective and boundary conditions of the assumed philosophic context.” (Kaplan, 2005, 1964, 184, italics added) For Kaplan, boundaries are the constraints imposed on research by the philosophic context of the theories guiding that research. Chimezie Osigweh, Yg (2005/1989) writes of “meaning boundaries” to refer to the attributes of a concept that give it meaning even if its scope is large, while Thomas Bouchard Jr. (2005/1976) equates boundary conditions with experimental context. Bouchard notes that three of the factors that characterize research field settings act specifically as boundary factors: intensity, range, and frequency and duration. These factors often allow a researcher “to explore and perhaps specify the form and limits of a relationship” (Bouchard, 2005/1976, p. 339). Each of these four writers use boundaries in slightly different ways, but all four recognize their power to delimit and limit the subject of investigation, be that theory, concept, or research. Theories exist within a set of boundary assumptions and constraints, and boundaries can provide meaning to concepts and define the conditions of a setting.

In public administration, in addition to the natural topic of international borders or frontiers,
boundaries tend to be used more to divide and separate than to define and limit. Donald Kettl writes that “Perhaps as much as anyone, Americans have always focused on boundaries.” (Kettle, 2006, p. 11) The Constitutional Convention, he suggests, “focused on where the boundaries of power ought to lie between citizens and government, between the federal government and the states, and within the federal government.” (ibid) In fact, “For American public administration, the core issue is not so much about the existence of boundaries. Rather, what matters is which boundaries ..., how they are drawn ..., and how to deal with the inevitable trade-offs” (ibid).

Beginning with Woodrow Wilson’s “The Study of Administration” (1887), Kettl argues that public administrators have understood that, “Not everyone can do everything. Building the capacity to do different things well inevitably means setting boundaries ... No boundary can be perfect or perfectly stable. But no action is possible without some boundary somewhere.” (Kettl, 2006, p. 12) Thus, Kettl suggests that the answer to the question of which boundaries need to be drawn has been found in balancing efficiency and effectiveness with accountability and responsiveness.

In addressing the question of how boundaries have been drawn, Kettl turns to street level bureaucrats for input. Traditionally, bureaucracy has been the structure used to accomplish complex administrative tasks, and since “most bureaucratic work is hierarchical;” and since “hierarchical work depends on authority;” and since “the underlying structure of these relationships is vertical”, bureaucracy has been preoccupied with “determining how and where to draw these vertical lines.” (ibid) Yet, studies of street-level bureaucrats (Lipsky, 1980) show “that other forces, including horizontal relationships, can undermine vertical, hierarchical systems.” (Kettl, 2006, p. 12) In the search for a balance between bureaucratic vertical boundaries and discretionary horizontal boundaries, Kettl argues that “the challenge is determining how best to draw boundaries to deal with situations in which even the best decisions can seem arbitrary and produce conflict between top-level control and operating-level flexibility.” (ibid) Thus, the traditional answer to the question of how boundaries should be drawn has been to balance bureaucratic needs with the need to remain responsive to the clients of the administrative state.

According to Kettl, the answer to the question of how to deal with inevitable trade-offs has been to accept Luther Gulick’s (1937) point that “there are alternative strategies for organizing bureaucracy” (Kettl, 2006, p. 12). “For bureaucracy in a democracy,” Kettl writes, “the central issue is how to create an administrative system that is strong enough to be effective but not so strong as to endanger democratic government.” (ibid) Managing the boundary between bureaucracy and democracy has kept public administrators preoccupied for over 100 years, and the consequence has been to rely “on administrative boundaries to control and manage important problems - to fit, sometimes awkwardly with a bureaucratic
Kettl’s central argument is that “The boundaries that served us so well in the past can no long (sic) solve either our administrative or political needs.” (ibid, p. 17) In the past, boundaries have been used to establish the shape of American administrative behavior. Specifically, they have been used to define the mission, resources, capacity, responsibility, and accountability of administrative institutions. But today expectations of government have changed significantly and the consequence has been to multiply programs and agencies along with a corresponding increase in network based service provision. Institutional missions have multiplied and become more difficult. With multiplying missions, the need for resources is also complicated. The capacity needs of administrative agencies have changed dramatically. The responsibilities of individuals and agencies within the complex and changing environment have become more difficult to identify. And accountability for complex, changing tasks has become more and more complicated and difficult to enforce. “Our boundaries” writes Kettl, “once provided reassuring (and often successful) answers to these five basic questions.” (ibid) Unfortunately, that is no longer true.

Kettl argues that the boundary problem in the United States is a serious one. For too long our response to new problems has been to draw new boundaries. However, “the instinct for restructuring often creates new vertical lines that only increase the complexity of creating a seamless service system.” (ibid) Instead, we should develop more collaborative structures that build horizontal relationships rather than vertical ones. “Devising new strategies to bring public administration in sync with the multiorganizational, mutisector operating realities of today’s government requires a collaborative, network-based approach.” (ibid) What we need today is “a fresh approach to government and management that builds on boundaries that strengthen democratic administration” as well as “new collaborative strategies that ensure that the instinct for drawing boundaries does not undermine democracy and public management.” (ibid, p. 18)

The call for “a fresh approach” is difficult to discount, and one that strengthens democracy is difficult to naysay in the United States. Yet Kettl effectively identifies the problem (restructuring that tends to increase the complexity of service systems rather than encouraging collaborative structures and action) without providing a real solution. How can one build on boundaries that strengthen democratic administration? How can one ensure that boundary drawing does not undermine democracy and public management? One effective solution is to turn to Polanyi for advice, to understand the boundaries that undermine democracy and collaboration as machine type boundaries. By admitting the active nature of bureaucratic boundaries that serve to fragment as well as define, public administrators open up the
possibility of using those same boundaries to unify and to actualize. In a world characterized by the dual control of hierarchical epistemological elements, boundaries serve to limit and constrain, but they do so in order to focus subsidiary elements to create new possibilities.

In developing his conception of boundary conditions, Polanyi begins, as we have, by emphasizing the difference between test-tube type and machine type boundaries. The former impose limits to facilitate observation and control of subsidiary elements. The latter introduce restrictions to harness pre-existing elements, to define new functions, and to create meaning. The former focus our attention on the elements or processes being controlled. The latter focus our attention on the strategies employed, on the boundaries, themselves. The former can be understood and explained in terms of their components; they are reducible to the elements of which they are composed. The latter work according to two different principles; their structure harnesses their underlying components in such a way that, while remaining dependent on those underlying elements, creates new purpose, new meaning that is not reducible. In other words, an understanding of the principles evident in the subsidiary elements does not explain the principles evident in the new structure that is a machine type boundary. Yet, it remains true that a focus on the new structure, alone, fails to develop the insights only visible from an understanding of the components from which it emerges. Polanyi’s short-hand for this distinction is dual control.

Machine type boundaries are subject to dual control. A machine type boundary becomes “a system which works according to two different principles” (Polanyi, 1969/1968, p. 227). On the one hand, its structure harnesses the underlying processes from which it is formed. On the other hand, the principles that limit and define those subsidiary processes also apply to the created structure. The structure brought into being by constraining the elements of which it is created gives those elements new meaning; reverting to a description based solely on the characteristics of those elements eliminates that new purpose. Thus, we see “a whole hierarchy of consecutive levels of action” (ibid, p. 226); a hierarchy of control or of organization or of meaning. In each instance of dual control, the upper level can not be defined in terms of the principles or laws governing the lower level. Yet the upper level remains subject to those lower level laws because it is emergent from the lower level elements and the principles that define and control them. In Polanyi’s words, “Such multiple control is made possible by the fact that the principles governing the isolated particulars of a lower level leave indeterminate conditions to be controlled by a higher principle.” (ibid, p. 233) Like machine type boundaries, test-tube type boundaries are “always extraneous” (ibid, p. 227) to the processes delimited, but unlike the former which emerge from the delimited processes, themselves, the elements of which test-tube type boundaries are composed are not the elements being constrained. Machine type boundaries emerge from the subject of interest.
while test-tube type boundary conditions are imposed from without. The latter are subject to a single level of control - control by the principles governing their subsidiary components. Emergence of new meaning, on the other hand, subjects the former to a second level of control. Not only are they subject to the principles governing their subsidiary components, but they are also subject to the principles governing the newly created organizational entity which is the boundary conditions, themselves. Thus, any attempt to shift from a test-tube type understanding of boundaries must necessarily involve a shift in focus - a change in subject.

By placing limits on the subsidiary components of which they are composed, machine type boundary conditions become a potential source of information. Polanyi uses the example of DNA because he is intent on showing how machine type boundaries apply to Biological processes and to the human body. He points out that the information content of a DNA molecule is dependent on only four organic bases, but because they are (with some minor exceptions) independent of each other, their natural randomness enables them to carry information. In a similar fashion, a computer hard disk can store large quantities of information as long as the magnetic particles of which the disk is composed are naturally random. If a large magnet is placed near to the disk, it forces all of those particles to align in a consistent manner, thereby erasing any information content. As Polanyi puts it, “It is this physical indeterminancy of the sequence that produces the improbability of occurrence of any particular sequence and thereby enables it to have a meaning - a meaning that has a mathematically determinate information content equal to the numerical improbability of the arrangement.” (ibid, p. 229) Structural stability at the subsidiary level effectively reduces potential information content, but where indeterminacy is present, the application of boundary conditions creates information. Rather than simply restricting and controlling the components of which they are made, machine type boundary conditions, applied to indeterminate subsidiary components, create information and enable meaning.

At this point it is perhaps helpful to summarize the key characteristics of machine type boundary conditions that we have identified from Polanyi’s writing. First, machine type boundaries harness subsidiary elements to define new functions and create new meaning. Second, they emerge from the subsidiary components of which they are composed. Third, and consequentially, they focus our attention on themselves, on the strategies, functions, and meanings created, rather than on an independent entity or set of components. In other words, they do not simply separate us from them. Fourth, they are not reducible to their subsidiary elements. This is implied in all three of the previous characteristics: their creativity, their emergence, and their power to draw our attention to themselves. Fifth, despite their independence but because of their emergence from the subsidiary, machine type boundary conditions...
remain subject to the principles that control those underlying elements. The fourth and fifth characteristics can be summarized in the concept of dual control. Machine type boundaries are subject both to the structure that defines them and to the principles that define the components from which they emerge. Sixth, machine type boundaries are part of a hierarchy of levels of constraint and meaning wherein each level is emergent from and subject to the principles constraining its subsidiary elements. Seventh, to the extent that their subsidiary components are indeterminate, machine type boundary conditions are carriers of information.

Another of Polanyi’s examples may help to bring these characteristics together. As I type these words, I am beginning with characters that are made up of lines (or possibly dots). According to Polanyi, the information content of these characters is in direct proportion to their indeterminacy; because there is no force that prohibits me from randomly placing them on the page, the boundary conditions that I enforce in the process of creating words take on an information content. By using boundaries to restrain the potential randomness of letters on a page, I give those letters new meaning, a meaning that is not enforced from outside of the letters, but that emerges from them. Once I have established the boundaries that create words, my focus turns from the letters to the words - the boundary conditions become my focus of attention. These creations of mine, these words, remain subject to the rules controlling the letters of which they have been formed, but they are not reducible to the letters, for without the boundary conditions that force them into words, the letters take on, once again, an indeterminate nature. Thus, these words are subject to dual control. Finally, these words do not stand alone, but are part of a hierarchy of information. Just as the letters are given meaning in the words created by the application of boundary conditions, so too the words are given new meaning when I constrain them to form sentences. Likewise, my sentences, which are potentially random in their placement, are given yet deeper meaning when I bring them together to describe concepts, to illustrate ideas, or to explain data. Yet even those paragraphs or groups of paragraphs are limited until I tie everything together into a cohesive paper or presentation - which, in turn remains isolated until it is presented in the context of a field of inquiry or a specific body of knowledge, bound within a set of conditions that I have enforced.

What we have ignored until now is another critical aspect of the structure that Polanyi is describing. Polanyi, himself, writes that, “When we look at words without understanding them we are focusing our attention on them, whereas, when we read the words, our attention is directed to their meaning as part of a language. We are aware then of the words only subsidiarily, as we attend to their meaning. So, in the first case we are looking at the words, while in the second we are looking from them at their meaning; the reader of a text has a from-at knowledge of the words’ meaning while he has only a
from awareness of the words he is reading; should he be able to shift his attention fully towards the words, these would lose their linguistic meaning for him.” (ibid, pp. 235-236) This from-at distinction that Polanyi makes is a reference to the concept of tacit knowing that he explains more clearly elsewhere. In “Sense-giving and Sense-reading” he writes succinctly, “in tacit knowing we attend from one or more subsidiaries to a focus on which the subsidiaries are brought to bear.” (Polanyi, 1969/1967, p. 182) There are three components to tacit knowing: the subject (“we”), the subsidiary, and the focal. But, it also has three epistemological aspects. Tacit knowing, he writes in “The Structure of Consciousness” has a functional aspect in which it bears “on something at the focus of our attention” (Polanyi, 1969/1965, p. 212), a semantic aspect in which it brings out the joint meaning of the focal and the subsidiary, and a phenomenal aspect in which it brings about a quality not present in the subsidiaries. Here we see some of the characteristics of a set of machine type boundary conditions being played out. First, machine type boundaries also express a directional function by focusing our attention on the boundary conditions rather than the subsidiary elements upon which they depend. Second, machine type boundaries create new meaning from indeterminate subsidiary components. And third, machine type boundaries create an entity that is unique and irreducible to a mere summary of its parts. In summary, Polanyi writes that “The logical structure of tacit knowing thus covers in every detail the ontological structure of a combined pair of levels.” (ibid, p. 218)

What Polanyi gives us, then, is an epistemological structure. Phenomenology, Polanyi writes, has taught us that “Each separate level of existence is of course interesting in itself and can be studied in itself.” (Polanyi, 1968/1969, p. 236) However, it fails to explain the structure by which one can understand the relationship between various levels of existence. Polanyi’s own solution to the study of a hierarchy controlled by boundary conditions involves consecutive acts of analysis and integration. “When examining any higher level,” he writes, “we must remain subsidiarily aware of its grounds in the lower levels and, turning our attention to the latter, we must continue to see them as bearing on the levels above them. Such alternation of detailing and integrating admittedly leaves open many dangers. ... But the principle of stratified relations does offer at least a rational framework for an inquiry into living things and the products of human thought.” (Polanyi, 1968/1969, p. 237) In studying machine type boundary conditions, we must learn to shift our attention from the subsidiary details to the focus and back again, always conscious of the consequences of dual control. As Polanyi makes plain, “These boundaries control a rising series of relations which we can understand only by being aware of their constituent parts subsidiarily, as bearing on the upper level which they serve.” (ibid, p. 238)

With this more detailed understanding of the function of boundaries in hand, we turn again to
public administration in the United States and the serious problem that Donald Kettl identified in “Managing Boundaries in American Administration”. The boundaries that Kettl describes are created to limit and control. On the one hand are citizens; on the other is the government. On the one hand is the federal (national) government; on the other are the states. On the one hand is one bureaucratic department; on the other hand is another. Kettl suggests that, historically, the boundaries that have been drawn have been those that balance efficiency and effectiveness with accountability and responsiveness, that they have sought to balance the bureaucratic need for vertical boundaries with the need to remain responsive to clients of the state, and that the central trade-off that has preoccupied administrators for the past century has been managing the boundary between bureaucracy and democracy. Kettl calls for collaboration as a solution but he does not explain how such a call mitigates the need to balance bureaucracy and democracy, vertical boundaries with horizontal responsiveness, or efficiency and effectiveness with accountability and responsiveness. In short, Kettl defines a goal but leaves the development of a plan to others. This is not surprising considering the task at hand. For over 100 years administrators have attempted to divide and control various elements of the administrative state, seeking always to impose an efficient structure from outside. Unconsciously, they have sought again and again to create more efficient test-tube type boundary conditions. What the mainstream of public administration has failed to do is to shift their attention from the contents controlled by their boundaries to the boundary conditions, themselves. What public administration has failed to do is to treat the boundaries that limit and constrain administrative activity as machine type boundary conditions.

Fortunately, not all public administration scholars have insisted on using boundaries to divide, constrain, and control. Not all have insisted on treating boundaries as objective tools to facilitate observation and regulate action. In one notable example, Camilla Stivers (2003) seeks to address the very boundaries that have frustrated Kettl. Recognizing that “Public administration is noteworthy for its concern for boundaries.” (Stivers, 2003, p. 210), Stivers attempts “to destabilize these boundaries for the sake of finding a new perspective by examining differences between administration and management from a standpoint that lies outside the existing limits of the dispute between them.” (ibid, p. 211) Recognizing that individual boundaries in public administration have been used to set up the focus for “a disciplinary discourse ... that constitutes participants in the discourse in a certain way” (ibid, p. 212), she sets out to redescribe the field in those terms. By looking at the field of public administration “as a disciplinary discourse in which contending groups (administrationists vs. managerialists) struggle over the system of significations that creates conceptual boundaries, inevitably privileges some meanings over others, and obscures potentially more fruitful ways of understanding the field” (ibid, p. 213), Stivers
hopes to “open up boundaries that have resulted from taking the dispute between these two concepts seriously in the wrong way” (ibid).

Beginning with dictionary definitions, Stivers then turns to the public administration literature to tease out subtle (and not so subtle) differences between “administration” and “management”. Using gender analysis, what she finds is a strong masculine connotation for both dictionary and literature definitions of management and a slightly weaker masculine (and thereby relatively feminine) connotation for administration. “Images of administration,” writes Stivers, “grounded in oppositions such as hard/soft, leader/follower, and objective/subjective, constitute a metaphysics of presence in which a ‘real’ administrator is apparently genderless but implicitly masculine, displaying some qualities and relegating others to the status of absent terms that impart meaning through contrast.” (ibid, p. 215) The ambivalence visible in definitions of administration are not as apparent in definitions of management. While the two are theoretically very similar, management has gradually become the more masculine concept. “The roots of management’s growing strength”, Stivers writes, “may have been its unswerving representation of itself as scientific, therefore grounded in hard facts, whereas administration struggled to balance normative elements with technical ones.” (ibid, p. 218) The gradual undermining of administration’s masculinity accelerated throughout the 1900s, particularly with the introduction of the idea of “public management”. “From the policy schools, however, has also come the severest attack on public administration’s boundaries - the idea of public management.” (ibid, p. 219) Slowly but surely, public administration became associated with unproven proverbs, a plethora of rules, and “service, publicness, ministering, justice, duty, and practicality” (ibid, p. 220), while management took responsibility for “control, results, efficiency, objectivity, and science” (ibid, p. 221).

Despite its best efforts, however, management could not make itself fully masculine, for control and handling of workers “meant not just giving orders but trying to keep workers reasonably content if only to avoid strikes or ‘working to rule.”’ (ibid) This obvious need expressed a “constitutively feminine dimension ... that required bounding for management to remain rigorous.” (ibid, italics added) As “public management” has taken over roles previously associated with “public administration”, it has been forced to confront “qualities that a mountain of research has demonstrated are conventionally associated with femininity” (ibid, p. 223). To enable managers (mostly men) to identify with these more feminine qualities, they have been “presented in the new management literature as neutral” (ibid). As public administration had previously done, management defined the manager as “a universal being, one without gender, no matter how many of what in other contexts would be considered womanly qualities are taken on.” (ibid) To do otherwise would have forced male managers into a situation where they (like their
female counterparts) would have to “struggle with dissonance between their sense of themselves and images that are promulgated as normative.” (ibid)

What Stivers has done in this article is to treat the boundaries that define public administration as more than mere limits that enhance our ability to observe public administration more astutely. To the contrary, these boundary conditions are expressions of power that seek to control and change their environment. Stivers focuses on a single boundary, that between administration and management, but her method could apply to the boundary between democracy and bureaucracy as well. By showing how this boundary has been co-opted by management, she shifts our attention from viewing it as a test-tube type to viewing it as a machine type boundary. By so doing, she forces us to become aware of the gender-based subsidiary components from which this boundary has emerged. While bringing to light the subjection of the administration / management boundary to gender influenced subsidiary elements, Stivers also recognizes that it can not be reduced to those elements, for it has created new meaning. Thus, as public managers attempted to broaden their own influence while reducing that of public administrators by shifting the boundary between them, what happened was a simultaneous shift in roles and responsibilities that forced managers to take on more “feminine” qualities. The boundary conditions for public administration created a new entity that was subject to dual control. Management attempted to redefine them by redefining the subsidiary elements upon which they are based but failed to recognize that, once established, the bounded definition of public administration is also subject to the principles of its own creation. The boundary conditions for public administration had become information carriers, and shifting them away from administration toward management applied that information content to management. As Stivers puts it, “within each term lie contradictions between conventionally masculine and feminine elements, contradictions that can never be resolved because they are constitutive.” (ibid, p. 227) “Public administration can never win its battle with management.”, she writes, “Nor can public management win its battle with administration ... Instead, both should redescribe themselves - or better, the field should redescribe itself.” (ibid, p. 228) The boundary dividing administration from management is not the apex of public organization. Rather it is one element of a higher level that, combined with other boundary conditions creating other new entities, form the subsidiary components of the field of public service.

We see, then, that Polanyi’s concept of dual control applied to machine type boundary conditions can be a useful tool for public administration academics. The following paragraphs describe its application in a more active, practitioner setting. In “Power, Money, and Politics in Community Development” (1993), Margaret Weir suggests that the key to successful community organizations has
been their ability to make creative use of federal programs, citizen participation, organizing networks, financial intermediaries, and a variety of tools. Norman Krumholz echos this emphasis on process over programs in “The Provision of Affordable Housing in Cleveland”. He writes that “What has evolved in Cleveland is a small cadre of community housing developers, supported by a web of personal and professional relationships among public agencies, private funders, corporate philanthropies, and local government. The result has been a remarkably effective network of CDCs under CHN.” (Krumholz, 1997, p. 70) It is the capacity of organizations to make use of existing resources that is the key to successful community development. While financial, political, strategic, and racial problems remain, the presence of talented people working within effective networks to creatively make use of existing tools becomes the measure of a potentially successful community development strategy. It is an effective process, rather than effective programs, that marks successful community development.

Recently, I was involved in the creation of a “connections plan” on behalf of University Circle Inc. which attempted to address the development needs of a small neighborhood (the Glenville / Wade Park neighborhood) along the border between the University Circle and Glenville neighborhoods within the city limits of Cleveland, Ohio. If Weir and Krumholz are correct, then, for efforts to develop the Glenville / Wade Park neighborhood are to be successful, they must be characterized by talented people, effective networks, and creative use of existing tools. A connections plan between two neighborhoods implies a relationship that goes beyond an occasional interaction across a border or boundary. In fact, two of the critical components identified by Weir and Krumholz, talented individuals and effective networks, are particularly affected by boundaries, but in different ways. Creative individuals find ways to work around the rules and regulations of which boundaries are composed, while networks are often disrupted by boundaries or at least forced to function at reduced levels of efficiency.

University Circle, Inc. (UCI) is the successor to University Circle Development Foundation (UCDF), a land bank that was formed in the late 1950s to help University Circle develop an “Eds, Meds, and Arts” economy through consolidation of key properties. It has since evolved into a development organization that continues to do development work but also provides services (from police to shared purchasing) and seeks to advocate on behalf of its member institutions as well as the residents in the surrounding neighborhoods. As I considered the needs of the (primarily residential) neighborhood just north of University Circle, I began to wonder what the effect would be of applying Polanyi’s concepts of dual control and machine type boundaries to the boundaries that we were seeking to break down. Is it possible that a redefinition of the boundary conditions involved in developing a connections plan between the University Circle and Glenville neighborhoods might reveal assets and liabilities more
appropriate to the problem at hand? Might a reconstitution of the boundaries around and between these neighborhoods bring to light new possibilities and opportunities?

Typically, the boundaries involved in defining neighborhoods are assumed to be political boundaries - test-tube type boundaries that enclose the subsidiary elements of interest. The boundary between Glenville and University Circle has historically been fixed along the center line of Wade Park Avenue but jogs north to Ashbury Avenue at E 118th Street, placing the homes east of E. 118th and south of Ashbury in University Circle in accordance with the Statistical Planning Area (SPA) boundaries set by the Cleveland City Planning Commission. However, separated from the rest of University Circle by the East Cleveland Cemetery and a railroad bed, this latter cluster of houses seems more connected to Glenville than University Circle. Another anomaly of the SPA boundaries is that the area between Wade Park and Superior Avenues and west of E. 105th Street is allocated to Hough rather than to Glenville, despite the natural boundary formed by Rockefeller Park. Ward boundaries, census block boundaries, and school system boundaries are all defined for different purposes and fail to match geographically, but all are defined for political purposes by “outsiders”, all function in a test-tube like manner to limit and control the residents and/or institutions on each side, and together they present a confusing picture.

Also confusing are the psycho-social boundaries assumed by residents of these neighborhoods. Generally, Cleveland residents living east of Rockefeller Park and west of E. 131st Street consider themselves residents of Glenville rather than Forest Hills (on the west) or Hough and St. Clair-Superior on the east. However, our research showed that many Glenville residents had come to see at least part of the study area as part of University Circle rather than Glenville. However defined, these boundaries are also test-tube type boundaries, excluding those outside from being counted with those inside.

Another way to define boundaries for the neighborhoods in question is to do so in economic terms, either based on income or on economic units of mutual-dependency. Income based boundaries have been less important in distinguishing University Circle from Glenville than have been boundaries defining economic units of mutual-dependency. In its early years as a Cleveland neighborhood, Glenville was economically integrated into the city as a whole. The same held for University Circle, and E. 105th Street was the artery that joined them together. However, the racial barrier that failed to block economic integration while Glenville was primarily Jewish, began to affect economic integration when its population became largely African-American. Eventually, University Circle pushed African-American residents out by acquiring and demolishing “most of the black residences in Wade Park.” (Souther, 2011, p. 39) As white residents of Hough, University Circle, and other central city neighborhoods moved to the suburbs, the economic diversity that once characterized the E. 105th Street artery withered and University
Circle became more focused on its “Eds-Meds-Arts” orientation, effectively erecting an economic boundary that matched today’s political boundaries.

What we see here is evidence of two machine like boundary conditions. As a boundary condition, race was not only used to define inside and outside or us and them, but it was used to change people’s lives. Thus, while UCDF was unsuccessful in acquiring property for institutional purposes from the residents of the Little Italy neighborhood to the south, they were able to do so from the African-American residents of the Wade Park neighborhood. Race as a boundary condition became more then a divider; it became a tool. Likewise, economic integration gave way to economic independence on the part of University Circle as its “Eds-Meds-Arts” focus became a tool or even a weapon to protect it from the economic downturn experienced in Glenville and other neighborhoods.

That race and economic dependency boundaries can be used as tools to change lives negatively, suggests that the alternative is also possible. By promoting racial integration across borders of any type, Glenville and University Circle can help to dissolve boundaries. By promoting economic integration with Glenville, University Circle can plant the seeds to further growth that is unhampered by political boundaries or psycho-social perceptions of limits. The assets and liabilities necessary for a connections plan, then, become the elements that either promote or undermine effective use of racial and economic integration.

There is a third machine type boundary or set of boundaries that could be particularly useful to creation of a community connections plan. In reality, this boundary is not singular but a set of boundary conditions defined by multiple planning agencies. The Famicos Foundation has developed detailed plans for the full study area that the City of Cleveland and Neighborhood Progress Inc. (NPI) have supported, while the Glenville Development Corporation has focused its resources at some of the gaps left by others. At the same time, the Cleveland Foundation has begun to promote a “Greater University Circle” that includes the study area, a theme echoed in the City’s comprehensive plan and in University Circle Inc.’s (UCI’s) vision of community connections. With the addition of UCI as a player what we see is a neighborhood bounded not by political, psycho-social, racial, or economic boundary conditions, but by networks of community minded organizations, by extensive planning efforts, by concentration of resources, by collaborative development efforts, and by creative individual thinking. Instead of simply enclosing and defining the neighborhood contents, these boundary conditions work together as tools to create novel ways of strengthening the neighborhood, itself, as well as the institutions involved in implementation of both a connections and a development plan.

What are the assets and liabilities available to “recreate” the Glenville / Wade Park neighborhood?
What subsidiary components will promote a community connection plan between University Circle and Glenville? Physically, the study area is in poor shape, despite extensive efforts to maintain it. It enjoys reasonable service levels, for the most part, and has growing neighborhood organizations. However, its greatest assets are the organizations actively interested in its development and the rapidly growing institutions just to the south in University Circle.

These assets and liabilities could be seen, in Polanyi’s terms, as either focal components (if they are the boundaries organizing other subsidiary components) or as subsidiary components (if they are organized by neighborhood level boundaries). From the perspective of the City of Cleveland, of NPI, of Famicos, of the Cleveland Foundation, or of UCI, these are all subsidiary components that strengthen or weaken their plans for the neighborhood. Each of their plans acts as an organizing set of machine like boundary conditions that has the potential to change the neighborhood and its residents but is simultaneously dependent on the assets and liabilities of the neighborhood. In truth, I overemphasized the test-tube nature of political boundaries, for they too can effect change. For example, having study area represented by both Ward 8 and Ward 9 forces developers to think more comprehensively and more inclusively. Ward boundaries do become active, focal components that can not be ignored. Yet, it is not organizationally adequate to consider the plans developed by municipality, foundation, development corporation, or other political entities as the apex of the planning pyramid, for together they act as subsidiary components that result in a reality that is full of possibilities. It is the built environment, the final result of their efforts that acts as the focus of their programs.

If each of these plans act as a subsidiary component of the final perceived product, then the comprehensive plan of the City of Cleveland, the Strategic Investment Initiative (SII) of NPI, the Famicos implementation of NPI’s vision, the Glenville Development plans for housing along Lakeview, the promotion of Evergreen Cooperatives by the Cleveland Foundation, and the Community Connections Plan being developed by UCI are all assets - or liabilities - to a larger end. Elise Bright points out, a “responsive, risk-taking, can-do attitude appears to be a unique attribute of those few cities that have achieved some measure of successful low-income neighborhood revitalization” (Bright, 2000, p. 146). This suggests that if Cleveland is to succeed in re-making the Glenville / Wade Park neighborhood, it will do so because of a responsive, creative process that, as Bright, along with Weir and Krumholz, emphasizes, is successful in working in a networked environment. In other words, the assets that are most critical to the viability of any development (or communication) efforts in the Glenville and University Circle neighborhoods are the processes in place to create opportunity and encourage creativity. Unfortunately the cooperation among and communication between these institutional players
is far from perfect. Whenever the subsidiary components of a set of boundary conditions are considered, it is important to recognize that they are effectively “amoral”. Those components can act as good or evil, as assets or liabilities, to benefit or to harm the focal objective at issue. Yet, the focus must remain on the objective or goal rather than the subsidiary component or the creative relationship will be lost.

Conceiving of the development plans for the Glenville / Wade Park neighborhood as subsidiary components, as assets and liabilities in themselves, is helpful, and all of the assets or liabilities mentioned are subsidiary components available to help break down economic barriers between Glenville and University Circle. However, the personal nature of racial barriers points to the importance of additional factors, particularly in the strategic investment in people.

Having explored the more general assets and liabilities important to the development of the Glenville / Wade Park neighborhood, it may be helpful to consider how the subsidiary components to other potentially machine like boundaries begin to be evident. Consider the student population of Case Western Reserve University (CWRU). At present there is a test-tube like resident-student-boundary along Wade Park Avenue with student residents south but not north of Wade Park. A few individuals have crossed this border, as individuals are wont to do, and a few developers have built student and staff housing north of Wade Park, but if this boundary condition can be seen as a machine like boundary, new possibilities emerge. As asset, CWRU is an abundant source of students who might consider low-cost housing in the study area, while Glenville has an abundant, although shrinking, supply of residents who might consider living in the more urban settings within University Circle. The housing stock north of Wade Park is plentiful, even if needing repair, and the proximity to CWRU is certainly an asset. What is perhaps missing is the approval of the study area residents and the types of services demanded by a student population. The addition of public transportation links running from the study area directly to CWRU, the potential availability of free wireless internet access through OneCommunity, and the addition of student-friendly restaurants and other commercial entities would make the study area more attractive to students seeking an alternative to Cleveland Heights or to University Circle housing. A more daring attempt to break down barriers between Glenville and University Circle would be the establishment of a CWRU satellite classroom site on Superior Avenue. There is certainly plenty of land available, and it is likely that there would be enthusiastic support from the City, community developers, foundations, and others involved in planning a new future for this portion of Greater University Circle. The establishment of a CWRU satellite on Superior Avenue would build confidence in the Glenville / Wade Park Neighborhood, facilitating the effective use of existing assets in the redefinition of barriers.

In conclusion, it should be clear that the promotion of talented people working within effective
networks to creatively make use of existing tools demands an alternative way of approaching even the identification of assets and liabilities. However, this is just the beginning. The central need in any networked environment is communication. Where an environment seeks to work democratically by involving community residents, that need is multiplied. The weakness of existing advocacy assets should be a concern and should become the focus of any effort to truly change the Glenville / Wade Park Neighborhood. One of the ways to facilitate improved communication would be to make sure that the residents of the neighborhood become fully aware of opportunities that are already available. Setting out on a journey toward improved communication and the redefinition of boundaries is a process, but it is an effective process, rather than effective programs, that marks successful community development.
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