Prepared for:
Giacomo Becattini, Marco Bellandi and Lisa De Propris (Eds.)
The Handbook of Industrial Districts
July 31, 2008

Conceptualizing the Dynamics of Industrial Districts

Michael J. Piore
David W. Skinner Professor of Political Economy
Department of Economics, Massachusetts Institute of Technology

The Italian industrial district first captured the attention of scholars in the 1970's. Since that time it has become a seductive model, attracting public policymakers and industrial development consultants across a wide spectrum. It has drawn the interests of developing countries seeking the survival and prosperity of their traditional industries in an increasingly open and global economy. But it has also become a model for local areas within advanced developed economies seeking to create high tech clusters. The literature describing these districts has grown apace, and there is now an enormous body of case studies of such districts in virtually every part of the world. But analytically the districts remain something of a mystery. It is very hard to understand why they arise in some places and at certain times and not in others, or what determines whether or not, and for how long, they survive. Moreover, it has proven to be especially difficult to reproduce such districts through public policy.

This article is an attempt to draw together from several apparently disparate sources some elements of a conceptual framework through which industrial districts and related, dynamic and innovative organizational structures could be understood. It focuses on two characteristics of those districts, characteristics common to virtually all of the individual case studies: First, the apparently contradictory combination of competition and cooperation; second, the amoeba-like character of the technological changes which define their dynamism (the tendency for both production and product innovation to take place around the edges of existing products and processes rather than in discrete jumps). A much longer list is presented in a previous paper which developed a more limited version of the argument presented here; it strengthens the case for using these ideas, especially those of communities of action, but it makes the argument too cumbersome to be presented here (Piore, 1992).

To understand these characteristics, the paper draws primarily on two sets of ideas. One of these is a distinction between analysis and interpretation, which I developed with Richard

Lester in a recent book, Innovation: The Missing Dimension, and which drew from a series of case studies on the organization of product design and development. The second is that of *Communities of Action*, a concept developed by Harrah Arendt based on a set of categories drawn from ancient Greece (Arendt, 1958). The latter has certain parallels in the elements of the working class subculture of a Boston community which Herbert Gans studied in the 1950's (Gans, 1962). Both Arendt and Gans take on added significance in the light of the history of some of the Italian districts which Sabel and I encountered in the late 1970's and early 1980's (Piore and Sabel, 1984). Both the product development cases and Arendt's Communities of Action point toward the centrality of what might be termed "public space," but the meaning of this term is not necessarily the same, and they have somewhat different interpretations for public policy.

This paper is divided into five sections as follows: The first and second sections summarize the ideas developed with Richard Lester and by Harrah Ardent respectively. A third section examines the parallels with Gans' Urban Villages. A fourth section presents a schematic history of the districts which Charles Sabel and I visited in the late 1970's and early 1980's and draws parallels to Ardent and Gans. A fifth section concludes, drawing out some of the implications for the possibility of managing industrial districts through public policy.

I. Innovation: The Missing Dimension

The study of product design and development was conducted primarily in the 1990's through the Industrial Performance Center of MIT. It was organized around three major case studies – cellular telephones, blue jeans, and medical devices – with firms in each drawn from Europe, the United States and Japan. In each company, we spent at least a full day, and often many more, interviewing managers and engineers. The study also involved extensive interviews with colleagues at MIT in engineering and management who taught courses or advised business clients on product development. What emerged from these interviews was a sharp dichotomy between theory and practice. Our academic respondents thought of design and development as an analytical exercise or, in other words, as problem solving. And the analytical vocabulary of academia dominated the interviews with operating managers and engineers. But the interviews with practitioners also revealed that there was another dimension to the development process; this dimension preceded and then accompanied analysis but was more difficult for the respondents to articulate.

Thus the analytical approach presupposed that a clear goal for the new product could be identified; designs were conceived in terms of this goal as means for obtaining it; and the design process was understood as one of arriving at an optimal design by working out the most efficient version of each design alternative and then comparing them in terms of cost and effectiveness. Particular emphasis was placed on breaking up the project into a series of separate, independent pieces for which this kind of analysis was feasible. But this approach begged the question of where the new product ideas and the various design alternatives came from in the first place.

In each of our case studies, it became apparent that the ideas actually emerged from something which was very different from analysis, something which appeared to be an open-ended discussion among the various participants in the design process. Those participants moreover came from very different backgrounds and engineering disciplines and the novelty and effectiveness of the innovations which emerged drew heavily upon the heterogeneous backgrounds. But the diversity of participants also made it difficult for them to understand each other and to interact in a constructive manner. This part of the innovation process involved overcoming these obstacles and the management of the interaction among the participants in a way which enabled them to move forward toward a set of design ideas.

We came to understand these interactions in terms of two metaphors. One metaphor was a cocktail party. The second was language. The interactions among the participants who in the early stages were basically strangers to each other were like a conversation at a cocktail party. The role of the manager is like that of the hostess at the party. His or her basic function is to invite the guests, introduce them to each other and get them to talk, prevent the kind of breakdowns which can occur in an argument or disagreement, on the one hand, and the introduce new topics or new participants when the conversation flags, on the other.

The conversation involved in generating new product innovation broke down into two distinct phases. The first phase involved developing a language in which the participants could actually talk and communicate with each other and with the customer to whom they expected to sell the product. The second phase involved using that language to work out and develop product ideas.

The nature of the process is easiest to illustrate in terms of the development of the cellular telephone. The cell phone is the marriage of radio and telephone technology. The initial idea was drawn from military walkie-talkies and car radios used by taxis, police and fire. Radio and telephone involved two totally different engineering cultures and business traditions. The

telephone is by tradition a perfectly engineered instrument; you never lose a call. It is designed and produced in large, expert companies who sell to equally large and expert clients (historically often owned by the same firm). Radio engineers are by contrast cowboys; the engineering tradition is basically empirical; the signal fades in and out. The engineer fiddles with the instrument to recover it. Radios are produced by very large companies but the customers are small service organizations for whom the radio is incidental to their central mission. In the beginning, moreover, there was no market for the cell phone; possible uses had to be imagined. It was initially a large car-mounted instrument and the vision was of the car's interior as a living room. It evolved only gradually over time into a completely portable handheld instrument through a process in which the producers tried to "read" the consumer and at once follow their lead and lead them through new designs in a direction they seemed to want to go. It is in this sense that one could say that the engineers had at first to learn a common language to communicate with each other while at the same time inventing a language through which they could speak to and with the consumer.

The initial phase of this process was particularly delicate because communication was so difficult and it was easily broken off through distrust and misunderstanding. Market pressures and the highly competitive environment which the market generated, not only among companies but among different divisions and even individuals within the same company, heighted distrust and inhibited open-ended conversation. In all of the major companies we studied, the cellular business was initially developed in a unit sheltered from the competitive pressures of the market and among the other units of the company. It was only later, once the basic language had developed and the direction of evolution of the product had become clear that the cellular division was reorganized along conventional business lines. The exact nature of these arrangements varied from company to company depending on its business tradition. But it was most dramatic (and is best illustrated) by AT&T, the American telephone monopoly subsequently broken up in the process of deregulating the industry. AT&T was an extremely bureaucratic company with its units managed in a very rigid style; but it contained within it Bell Labs which functioned in a much more informal, academic manner, and it was in Bell Labs that cellular technology was initially developed and brought to maturity.

The interpretative aspect of product development can be understood as suggested earlier in terms of a language community – first the development of such a community and then the use of the language associated with it to generate innovative ideas. The language metaphor suggests

that we can turn to language theory for further insights into the process. Two insights in particular emerge in this way: The role of ambiguity and the way in which a language (and by extension a product) evolves through usage.

Language evolves from clarity to ambiguity. When strangers from different language communities first come into contact with each other, the first language which develops is a pidgin, what the dictionary defines as a trader's language, where meanings are clear and unambiguous. If intercourse between the two communities continues, however, a true language or creole, emerges (usually only in the second generation) with a complete grammar. A creole is distinguished from a pidgin by the fact that meaning is ambiguous and it is continuously clarified through conversation. In the economy, it is in the space of ambiguity that opportunities for profit emerge; innovation can be seen as the product of ambiguity (note that this is a very different idea of profit than what comes out of theories of information and arbitrage). But the second point is that a language, once formed, evolves through usage. The determinants of its evolution include the kinds of people who use it and interact in the process, but also the topics around which that interaction revolves. Both sets of ideas point toward the centrality of what might be termed "public space", i.e., venues of open discussion and debate, sheltered from the competitive pressures of the market. But equally important to the openness of the discussion are the subjects upon which the discussion focuses and the character of the interaction which occurs within this space.

II. Hannah Arendt

A second set of ideas which are useful in understanding the underlying nature of industrial districts and which both complement and add nuance to those from the product development study are developed by Hannah Arendt in The Human Condition. Arendt's argument is built around a typology of human activity that she abstracts from classical Greek thought and then uses to trace the evolution of work (and the social value placed upon it) in Western thought. The typology first makes a fundamental distinction between *la vita active* and *la vita contemplativa*. The latter involves a withdrawal from interaction, with the world (significantly both the social and the physical) and retreat toward introspection. This is a stance which Arendt herself rejects (and which is certainly irrelevant in an understanding of industrial districts given their preoccupation with production and community). Her focus is thus basically upon activity within the vita active. Here she distinguishes first between labor and work. The

two words are now used interchangeably and both are associated with production in the conventional usage of that term. But Arendt argues that there is an important distinction between them that is residual in virtually every language.

Labor is the activity associated with the reproduction of life and nature. In ancient Greece, it was the activity of women and slaves, performed in the privacy of the household and separated from public life. It is cyclical and, in its cyclicality, is repetitive. Its products are ephemeral. It requires the individual to align him or herself with the rhythm of nature and to become part of it. Its original meaning survives in the use of the term labor to refer to childbirth. In modern times, mass production, because it is repetitive, has taken on this character, although Arendt regards this as a distortion of the human capacities associated with labor.

Work, by contrast, is the activity of the artist or craftsman, signaled by the way we use the term when we speak of a "work of art". It is the production of an object which then exists separate from its creators and survives in the world (unlike labor) independently of the act of creation. It moves from the private realm of creation to the public realm of "existence," where it is permanent and enduring, and in so doing gives the creator an immortality which labor, bound up in the perpetual cycle of birth and death, cannot confer.

But the privileged activity in ancient Greece was neither labor nor work, but action. Action was the activity of political and military life and reserved for a limited class of citizens who were relieved of the necessity of labor by a private household staffed with slaves. Action took place in the public space. It was the small acts of rhetoric or battle spread out and accumulated over a lifetime. Arendt argued that together the sequence of such acts formed a story or narrative of a person's life. And if that story was great and unique, it would be recognized and told by one's friends and colleagues after death, and passed on from one generation to another, giving the person a kind of immortality. This was an immortality which labor could not confer and which in work, through the separation of the product from its creator, lost the intimate connection to the individual person. For Arendt, and for the Greeks, action was the greatest and most human of all activities. And it also seemed most relevant to an understanding of the Greek city state.

But action was only possible in a particular social formation. That formation involves a community of people who are not only equal politically but who are equal in the sense of being alike. Only a community of people endowed with essentially the same material out of which to create their life can appreciate the uniqueness of what one of their colleagues has made with that

material. Thus, the venue of action is like a theatre in which the audience and the players are one and the same, and the players play for each other.

The construction here is very much that of a team of professional athletes or an elite scholarly community. The athletes actually have a dual audience, the fans in the stands and their fellow players on the field. But the audience which matters is the one on the field. Like the Greek citizens in the forum, moreover, the reputation of a professional athlete is made not by one move in one game but by the long sequence of moves in many games over a player's career. Team sport is the canonical case of the marriage of competition and cooperation. The team members are competing against each other for fame and renown and yet they need their fellow players both to play the game and to validate their achievements.

Elite scholars within an academic discipline are similarly working for the recognition of their colleagues. And recognition (the Nobel Prize to the contrary) is accorded not for one major achievement but for the series of relatively small, but each particularly clever, contributions over a lifetime.

Industrial districts embody exactly this construction: a community of people with essentially the same heritage producing a series of innovations, each small in itself, but together gaining the recognition of their colleagues. The focus in economic studies is always upon the district as a productive community, and the skills which they display are basically craft skills. But what makes these communities successful, and what is remarked in discussions with the members themselves, are not the skills but the innovations, and these are not particularly in the final product but can be in production technology, design or even business practice. In this sense, it is not the craft which is valued or "work" in Arendt's sense of the term. But the activity there is not either labor in the sense of aligning oneself with nature; nor is it the production of objects. Rather, it is the production of small and particular innovations – in design, in production, even in sales or community leadership – that win the notice and admiration of those around them who are like them. Because what is involved are small innovations, the repertoire of the community evolves like an ameba. Because the members of the community are working for each other's admiration but to distinguish themselves as individuals, they combine community and cooperation in the same sense as an athletic team or a scholarly community.

But there is here a final parallel between a successful district and an athletic team which is not noted in Arendt's characterization: The district and the team play for the insiders, but they survive only if the outsiders appreciate what they are doing. The team needs the fans to pay for

the sport, and the industrial district needs the customers to buy their products. And in the latter case, it is not enough for one firm to succeed in the marketplace; the community only survives if the firms as a group succeed. In this sense, there is a strong tension in the orientation of these communities – but it is not the tension conventionally noted between competition and cooperation. It is a tension between the inside and the outside orientations.

In many ways, the most critical point in terms of understanding the implications of this is another point which Arendt herself does not make. Communities of action are like language communities. A language is defined by a set of grammatical rules and a vocabulary which all members of the community inherit as a basic resource. But, despite the well defined nature each member of a language community speaks in a distinct way, recognizable to other members but not to outsiders, and the language evolves around the edges in an amoeba-like fashion in the process of use. It is this analogy to language that links Arendt's communities of action so closely to the process of innovation as it emerged in the studies at the IPC.

III. Gans, Urban Villagers

Arendt's communities of action appear in a totally different literature, far removed from Greek political life: a literature on working class subculture. The parallels are particularly striking in the characterization in Urban Villagers where Herbert Gans summarizes the extensive sociological literature on class subculture and expands upon it through a study of a Boston neighborhood in the 1950's. Working class life as characterized by Gans is played out in terms of two distinct sociological structures which anchor individual (male) identity. One is the family and the series of roles which family life prescribes as one moves through the lifecycle. The second structure is the peer group, composed of boys who grow up together in the neighborhood and spend their youth and adolescence hanging out and playing together. Gans characterizes this initial stage of peer group life (especially in adolescence) as "adventure seeking," but he could well have used Arendt's term "action". The youth are engaged in a series of exploits in which each tries to show his daring and bravado, drinking bouts, trysts at local beaches and amusement parks, trespassing on the territory of forbidden gardens, orchards and other private property or in other neighborhoods, petty theft, spray painting, etc. Through these adventures the individual members of the peer group achieve particular identities signified by nicknames associated with particularly noteworthy exploits (adventures). For a more contemporary account with lots of specific examples, in this case an Irish working class neighborhood, see Hayes (2002).

When the youths mature, they marry and settle down; their roles in the family take priority, and these adventures come to an end. The peers continue to hang out together in their leisure time, mostly drinking and playing cards, again significantly in terms of Arendt's notion of action, reliving as narrative tales told to each other the adventures of their youth and reinforcing the individual identities anchored in these adventures.

The adventure-seeking peer group of Gans' depiction of working class youth is actually a general feature of American life. It is reproduced in the youth of professional and managerial workers in their college fraternities. It also features prominently in studies of computer hackers, many of whom go on to seed the IT industrial districts (Turkle, 1984).

The other feature of Gans' characterization of some interest here is the way his working class culture maps onto labor market roles. Adult working class men are engaged in regular industrial work, the kind of work which Arendt sees as the modern, "artificial" labor of mass production. Indeed, Gans calls their lifestyle "routine-seeking" in contrast to the adventure-seeking of adolescence; the lifestyle facilitates adjustment to industrial work. The adventure-seeking youth take temporary unskilled jobs which provide pin money for their peer group activities without distracting from them. But the ideal economic activity for the working class, according to Gans, is in the family firm, which is an extension of the household and take place in what Arendt would call the private sphere. He does not describe these firms, but he suggests that they are largely engaged in petty commerce, although they could also be craft enterprises, which would complete the parallel with Arendt's typology.

Gans focused on the West End of Boston. At the time, it was a largely second generation Italian immigrant community. Although he characterized it as working class and grounded his findings in the literature on class subculture, it could as well have been an Italian immigrant subculture that he was studying. It takes on added significance in the light of the history of the industrial districts that Sabel and I encountered in Central Italy in the late 1970's and early 1980's (Piore and Sabel, 1984).

IV. Italian Districts

The key factor in that story was the labor unrest associated with the hot autumn of 1969 and the rigidification of work rules in large manufacturing factories to which it led. That had three effects. First, the large firms laid off a number of their skilled workers, many of whom used the large severance packages mandated by Italian law to found their own small firms. Here

they joined the ranks of small scale producers which had already been seeded in this way by the purges of left wing militants in the 1950's in reaction to previous waves of labor unrest. The firms operated with relatively little capital using family labor working out of the house and associated outbuildings. Second, companies sought to evade the restrictions in the large plants by subcontracting to these very small firms, and their erstwhile employers whom they knew well had an inside track to this work. The small firms took the contracts but sought out other customers whom they could work for in off hours and began to escape dependence on their erstwhile employers. Third, the rigidities led to a very large increase in youth unemployment, particularly in large organizations where jobs were reserved for senior and more experienced workers.

The key in the transition from subcontracting and evasion of labor rigidities to industrial districts were the children of the previous generation of skilled workers. These kids had grown up working summers and after school in the parents' shops, and in the process acquired a craftsman's on-the-job experience. But unlike their parents, they also had a good education and in fact many of them had gone to university, and had been planning a white collar professional or managerial career in government agencies or large companies. In the face of youth unemployment, however, they were forced back into their parents' shops when they graduated. Thus, there emerged a generation of craftsmen, with university educations, exposure to the wider world of European trade fairs and technical periodicals, and a frustrated ambition for larger things. It was this generation which transformed the conglomeration of subcontracts into an industrial district of independent shops. Again and again, when we visited these shops, the younger generation were too busy managing the enterprise to take care of us and we were escorted around the shop by the proud but old and gnarled fathers (and once in a while, mothers). The story their parents told as they showed us their shops was how the kids had developed their own technologies and styles as the university educated children visited the trade fairs around Europe copying designs, studying catalogues, reengineering equipment, and picking up new ideas wherever they could. Finally, these kids began to specialize, some in production, some in equipment design, some in product design, working with their neighbors in other branches of the business.

V. Conclusions

It is conventional in an article of this kind to conclude by focusing on the implications for public policy. In this case, the implications of the ideas developed here are not formulaic; they do not suggest a list of specific policy measures. Rather, they suggest a way, or more exactly ways, to think about public policy. There are two implications which, broadly speaking, the two sets of ideas do share. First, they both point to a focus on the social, rather than the narrowly economic, nature of industrial districts. Second, they suggest a focus on process rather than on inputs and outputs. They imply a shift in emphasis from the provision of specific services (e.g., capital, training, market research, etc.) to the orchestration of the social interactions of the members of the community. But the two sets of ideas have somewhat different implications for the nature of the process one is trying to create and manage and for the likelihood of success.

Our Innovation book has more specific and more operational implications than Arendt's notion of communities of action. It suggests the need for sheltered spaces, protected from competitive pressures, in which an open conversation can occur and the management of that conversation so as to: (1) draw into it a set of actors with diverse backgrounds and experience; and, (2) prevent it from getting stale by seeding it with new topics and new participants. How easy it might be to do this is an open question. The focus upon new products which actually found a market in the case studies upon which the book is based gives an optimistic cast to the prospects for success. But at least it does clearly suggest what to look for in order to improve these prospects.

Less optimistic on this score is Arendt's characterization of communities of action, especially as amplified by Gans' study of working class peer groups and the early history of Italian districts. The critical social structures are deeply embedded, rooted in social experiences that are not easily created where they do not already exist. The language analogy, upon which the Innovation book draws so heavily, still seems relevant, but the application of this analogy to communities of action underscores the fact that the aspect of language at work here is not the way it operates as a vehicle for communication, and still less, as a vehicle for the exchange of information. Language is rather a marker of identity; the language community is the context in which identity is created and enacted. The act of speech which language permits is a process, in other words, of identity creation. Probably, such identity communities are latent in many social settings; maybe like language they are inherent in all human community, but they seem to be rooted in relationships which develop in youth and adolescence and not in the kind of adult interaction which the cocktail party metaphor implies. If they are universal aspects of humanity,

economic production and exchange are not universally rooted in them. Perhaps public policy could nonetheless generate such communities or turn them toward economic ends. But it seems that to do so it would have to focus on something that happens in the schools rather than sponsoring forums in city halls as the cocktail party metaphor seems to imply. It is not the specific knowledge imparted in the classroom that is of concern but rather the way in which the students are encouraged to use the material of the classroom and the economy to express themselves and their relations to each other. It thus seems more likely that these insights will help us to preserve the communities of action that already exist (or are already focused on economic activity) rather than to create new ones.

References

Arendt, Hannah. The Human Condition. Chicago: University of Chicago Press, 1958.

Gans, Herbert J. The Urban Villagers: Group and Class in the Life of Italian-Americans. New York: Free Press, 1962.

Hayes, J. G. This Thing Called Courage: South Boston Stories. New York: Harrington Park Press, 2002.

Lester, Richard K., and Michael J. Piore. Innovation: The Missing Dimension. Cambridge, MA: Harvard University Press, 2004.

Piore, Michael (1992), "Work, Labor, and Action: Work Experience in a System of Flexible Production" in Thomas Kochan and Michael Useem (Eds.) Transforming Organizations, New York: Oxford University Press, pp. 307-18.

Piore, Michael J., and Charles F. Sabel. The Second Industrial Divide: Possibilities for Prosperity. New York: Basic Books, 1984.

Turkle, Sherry. The Second Self: Computers and the Human Spirit. New York: Simon and Schuster, 1984.