The Creative University in a Flat World

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Tom Friedman, in his bestseller <u>The World is Flat: a brief history of the 21st century</u> [1]
describes a world in which decreasing trade barriers and rapid advances in technology,
especially communication technology, have led to a revolutionary globalization of industry. In
this new world, corporations create global supply chains for services and manufacturing by
searching out the best providers wherever they may be. Companies in China, India, Brazil and
Indonesia are now able to compete on a level playing field with American companies for spots in
those global supply chains. The world has been flattened

However, numerous studies show that the global playing field is not, in reality,
completely flat. There are geographic areas where particular types of activities can be carried
out with unusual efficiency and creativity. These are areas that John Hagel and John Seely
Brown[2] called local ecosystems that can amplify capability-building opportunities, that Susanne
Berger[3] calls clusters, and Richard Florida calls learning regions[4] or creative centers[5]. Special
characteristics of these regions enable them to become centers of creative activity of one type or
another. As a consequence, companies located in one of these areas still have a competitive
advantage over similar companies not located in such a cluster elsewhere.

For many of these special local ecosystems- but not all - a university provides a center for
creativity that plays an important role in producing the special characteristics of the region.
Thus the ability of the university to encourage and support creativity is key to its role in such an
ecosystem. For obvious reasons, I will focus on those regions where a university does play a
central role, but it is important to recognize that many of these regions do not include a

university. And, in the opposite sense, many very creative universities are not surrounded by a creative ecosystem. As we shall see, many elements must work together to produce one of these creative regions.

I will return at the end of this talk to a discussion of this relationship between a university and its surroundings. However, since creativity of the university is key to its role in such a relationship, let us first look at the concept of creativity, and how it can be encouraged and supported.

Our focus in this discussion should be on what Arieti[6] calls Agreat creativity@ - creativity that changes society and culture, rather than the creativity of everyday. This is a subject that has been considered by many authors using many viewpoints, looking from many different fields of expertise. There are themes that run through the different perspectives, however.   I find the systems approach described by Mihaly Csikszenthmihali in <u>Creativity: Flow and the Psychology of Discovery and Invention</u> [7]to be very useful in sharpening many of these common themes, and in showing how they can be applied to important questions of why creativity is or is not to be found in a particular domain at a particular time and place. Much of my discussion will therefore parallel his work.

The central component of the understanding of creativity is to realize that it is an interaction between an idea, and society. Csikszenthmihali[8] explains this interaction in terms of the memes[9] of society B the units of information that are passed on from person to person that in their ensemble define the society. The meme is the cultural analogue of the gene in biology. An idea that changes a meme in such a way that the modified meme is accepted by some significant element of society thus changes the society. Such an accepted meme-changing idea is said to be

a Creative idea.

Thus a creative idea does not stand alone, but is part of a process in society. In fact, in Csikszenthmihali=s systems view of creativity, there are three components to the creative process[10], and they all can affect the likelihood of the appearance of creativity:

1.   The domain: some set of knowledge consisting of a set of rules and procedures. This set could be mathematics, history, film making, politics; or on a finer, fractal like scale, algebra or American history or corporate financing; or down another fractal level, aircraft design in a particular company. The domain is where the acceptance of the creative idea will lead to a change;

2.   The field: the set of people who determine if a new idea should be part of the domain - the changed meme must be accepted by some group; and

3.   The person who has the idea.

All three of these components must work together to produce a creative idea. If not, as Arieti said in Creativity: the magic synthesis,[11] speaking of the creative idea: AWhile it uses methods other than those of ordinary thinking, it must not be in disagreement with ordinary thinking - or rather it must be something that sooner or later, ordinary thinking will understand, accept, and appreciate. Otherwise, the result would be bizarre, not creative.@ Thus, the difference between a bizarre original idea, and a creative one, is the acceptance by the field.

Let us begin by focusing on the last of the three components of creativity, the person with the idea, before turning to the role of domain and field in the appearance of creativity. Almost always, the person first has mastered the domain - understands the information in the domain, and the rules by which it is organized. In addition, the person has internalized the criteria of

selection of the field. That is, in choosing which ideas to follow, the person must understand the selection criteria, else the result is likely to be defined as bizarre, not creative. Then, the person must be able to get access to the field - the decision makers. Ideas hidden in closets will not be judged creative.

It is pertinent to take a slight aside and ask whether a test can tell us who will be creative. That, it turns out, was the question the air force asked of J.P. Guilbert of USC during WWII. They wanted to find pilots who would react creatively in an emergency. In response, Guilbert started the whole field of creativity testing here at USC. In fact, his tests really measured divergent thinking, which, as we shall see, is important, but not sufficient.

Although tests are difficult, research does enable us to sketch out personality characteristics of the typical creative person. The creative person turns out to be a study in contrasts - someone who shows contradictory personality extremes. Among them:

- Smart/ naïve - have to be smart (seems to be a step transition point at about 120 I.Q., with most creative people above that point. There is, however, no increase in creativity with I.Q. above that), but have to question in a naive, open fashion;

- divergent /convergent thinking - lots of new ideas, but can converge on those that are good;

- Playful/disciplined - have fun with ideas, but can slog through the necessary details;

- Extrovert/introvert - interact with others to get new viewpoints, ideas, and to make contacts with field, but can shut oneself into a room for long periods without external stimulus;

- Judging/perceiving - prefers closure with ends tied up, but can be comfortable with ambiguity and a desire for yet more data before a decision;

- Sensing/intuitive - needs hard data and concrete facts defined by the senses, but is

comfortable with ideas and concepts, the big picture;

- Traditional/rebellious - has mastered the domain, and accepts its rules, but takes chances without regard to the past.

The process of creativity has been widely studied. Depending on the author, it is usually described as having between 3 and 7 steps. I think Csikszenthmihali=s 5 steps[12] contain it all pretty well:

1. Preparation -, analysis of needs- finding a problem, learning a lot of background, looking at alternatives, etc;

2. Incubation - not consciously thinking about the problem, but things are happening below the level of consciousness in a nonlinear way. At work in this step, according to Arrieti[13] are Aancient, obsolete, and primitive mental mechanisms generally relegated to (the) recesses of the psyche..@;

3. Insight - the aha moment;

4. Evaluation - is the idea worth pursuing?;

5. Elaboration - showing it works.

This step last step of Elaboration is critical for the idea being accepted by the field. It is usually here that the greatest effort is required. Speaking primarily of this stage, Edison is famously quoted as having said A creativity is 1% inspiration and 99% perspiration@. In reality, of course, the process of creativity is more often iterative rather than linear, as elaboration often leads to (and demands) additional insights.

Now, having looked at the role of the individual in creativity in some detail, let us turn to the question of the role of field and domain in creativity. Here, again, I find the analysis of

Csikszenthmihali[14] to be particularly powerful, and I follow it closely below.

Because creativity is a complex process involving three components, the amount of creativity in a given field at a given time does not depend exclusively on the intelligence or originality of the people in the field. It also depends on the structure of domain and field and their openness to new ideas. For example, is new knowledge a central focus of the domain? New knowledge often is at the center of a newly developing domain, and becomes more unlikely in a mature domain. Is the information of the domain easily obtainable and well organized, such that the researcher can find all the information she needs? After all, finding pertinent information is the first step in the creative process. Are the logic and rules of the domain clear, strict, and universal (tightly structured), or is the domain made up of a more diffuse system of thoughts without clear universal rules (less well structured)?

This question of the structure of the domain is quite important. If it is tightly structured, such as math or physics, then the rules of deciding what is Acorrect@ or Aincorrect@ are well defined, and the information of the domain is well organized into accepted categories. In this case, it is easier for a young person to learn the rules and the information and jump to cutting edge. In addition, something new stands out, and is generally accepted rapidly. However, for less well structured domains, such as areas in social science, it may take decades to really master the domain. And, because of the less well defined nature of the domain, it may take the field many years to decide if an idea really is an improvement on existing knowledge.

Before looking at how the field can affect creativity, we need to be clear on what the field is. The field is any group that serves as gatekeepers to the domain, and it is very important to note that the composition of the field can change over time. For example in renaissance Florence,

the field of art was composed of a relatively small number of rich patrons who funded specific proposals from artists that they believed would be most successful in turning Florence into one of the most beautiful cities in the world. Today, the field of art would be composed not only of the patrons who pay for the art, but also art critics, academics, and other artists. At other times and for other domains, the field may be composed primarily of the people working in the domain e.g. peer review determination of who publishes, gets financial support. And in domains such as politics, the field is a complicated mixture of the voting population, lobbying and news organizations, donors, etc.

The field is of course the group that decides which new ideas in a domain will survive - that is, it defines which new ideas are creative and which are bizarre. Consequently, the characteristics of the field have a lot to do with whether creativity is associated with a domain. Csikszenthmihali suggests three ways the field affects creativity[14]:

1.   Does it solicit or stimulate novelty?

    a.   For example, in Mozart=s time, the field was composed primarily of rich patrons who desired to show their sophistication through performance of new and novel music. Consequently the field was proactive in soliciting novelty

2.   Does it set a very high or a very low bar for the definition of novelty?

    a.   does it really hold out for the very best new ideas and kill the others, or does it allow in a much broader set of still very good new ideas?

    b.   at the extreme, in the former case, the domain risks stagnation, in the latter, too much undigested novelty

3.   Is it connected to society in a way that attracts support?

There is a complex balance between impact of field and of domain in stimulating creativity. In well structured domains such as physics, the domain is rather rigid, so the field cannot decide to accept just any new idea that someone likes. In art, the domain is much less constraining - there are no well defined rules on what makes great art - and so the field is able to define what is worth bringing into the domain.

With this brief overview of the interplay between the three components of the creativity system, let me turn to the more practical question AHow can the probability of personal creativity be increased?@ The response to this involves both components that the individual can search out, and also things that institutions and society can do to help

Numerous authors have suggested that there are characteristics of place that matter in increasing the likelihood of creativity. For example, Csikszenthmihali[15] notes that the creative person must be able to access the domain, and the domain generally is not equally distributed geographically. Domain-specific information (archives, researchers and teachers, etc) is clumped in different geographic locations, and consequently study of certain domains may be best done those centers of those domains. Arieti[16] describes a similar geographic attribute as leading to the Ainteraction of significant persons.@ Conversely, there are areas where the domain is not well represented. One would not want to study agriculture in Los Angeles, for example.   Similarly, one must be able to realize the idea in order to present it to the field. Centers that facilitate this realization, e.g. centers of resources such as venture capital, may be geographically different from the centers of the domain. Both Arieti[17] and Florida[18] emphasize that areas that have exposure and openness to different and contrasting cultural stimuli seem to stimulate creativity.

Societies and organizations can help to increase creativity in several ways. One is to have high expectations for performance, always, of course, making sure the expectations match potential. And the flip side of expectation - both extrinsic and intrinsic reward for good performance -must exist. Although both kinds of reward are important for creative people, it appears that intrinsic rewards are perhaps even more important that the extrinsic ones[19]. Thus it is very important that organizations - especially schools - not set up conditions that stifle intrinsic motivation through boring presentation, rigidity, or too many competing pressures.

Given that creativity is the result of a complex interaction between and idea and society, it is not surprising that having a mentor who is an established member of the field is important in encouraging creativity in a novice. Much of the information needed to understand the rules of the field, to attract attention and approval of the field is to be found only in the heads of those who have succeeded. As Merton[20] showed many years ago, the choices made by a field are not necessarily Afair@, but show what he called the Matthew effect, or Frank and Cook[21] called winner-take-all. That is, those who have had ideas accepted as creative are much more likely to have another idea accepted as creative, than is someone who has not yet had an idea defined as creative. A mentor can help break into that loop.

Resources are clearly important in creativity, since the idea must be realized in order to be judged. Thus the person must have enough resources to Aget traction@ in realizing the idea. However, too many resources can reduce creative tension and lead to a loss of focus, thus decreasing the potential for creativity.

The Harvard Business Essentials book on Managing Creativity and Innovation[22] looks at creativity from the organizational standpoint, and reminds us that creativity is a function of three

things: Expertise, creative thinking skills, and motivation. Therefore, it is logical that an organization is most likely to get creativity when people are in positions where they can focus on something that makes the most of their expertise, creative thinking skills, and intrinsic motivations . The intrinsic motivations are, of course, most likely to be maximized if the person is doing something that she loves. Corporations can move people around the organization to get the best match possible. For universities, this may be more difficult. However, the creative university can encourage its members to follow their interests beyond traditional departmental or disciplinary boundaries as their intrinsic motivations and interests change.

The organization seeking to stimulate the creativity of its members should support and encourage interactions between people with different expertise. ΑCross-fertilization@ of ideas is a significant stimulus to creativity. As a consequence, corporations seeking creativity have found it very important to move people around from group to group in order to maximize exposure to different ideas and viewpoints. In addition, the creative organization should minimize constraints, and maximize enablers so that people can focus on what they are doing without feeling that they are torn in too many directions, or that they are mired in a bureaucracy that prevents them from focusing on their real interests.

It is also very important that the creative organization accept and encourage intelligent risk taking. Creativity does not exist with risk of failure, and it is important that the organization work to lower the personal cost of failure. This is an area where universities need to pay close attention, because the tenure system generally produces a very high personal cost of failure for beginning faculty. Thus, our system may work against creativity for a large group of our faculty.

Group creativity is increasingly important in corporations, and increasingly so for

universities. Not surprisingly, there is considerable work looking at how to make creative

groups. It turns out to be that the group most likely to be creative has the same set of mixtures of

opposing characteristics as are shown by a creative individual. That is, the group needs

convergent thinkers, and divergent thinkers; experts, and Abeginners@; introverts and extroverts,

etc. And, of course, in the group, one also can bring people in who are experts in different

domains pertinent to the issue at hand. In universities, we often are good at bringing people with

different domain knowledge into a collaboration, but seldom think of the mixtures of personality

characteristics that industry would find critical to creative success.

Amabile, Hadley and Kramer[23] have looked at the fascinating question of the effect of

pressure on creativity.   They find that pressure stimulates creativity if people feel they are on a

mission (think of Mission Control during the moon flights). People in that situation understand

why solving a problem quickly is important, and buy into the urgency. Further, under such

conditions, management understands that the people need to have their focus protected from

extraneous pressures during the critical phase. However, pressure does not stimulate creativity if

people feel they are on a treadmill with too many distractions, too many problems

On the other hand, lack of pressure enables creativity if people feel they are on an

expedition, exploring and generating new ideas rather than identifying and fixing problems. But a

similar lack of pressure does not stimulate creativity if people are on autopilot, just doing the

usual.

So our deviation to look at creativity shows us that creativity is a complicated function of

domain, field, and individuals. Where and when creativity appears depends on all three. We also

see that domains can change, e.g. can become more or less well structured over time. Fields can

change also with, e.g. an ebb and flow of power between experts and funders. In addition, the

focus of funding may shift, with funding with the right creativity characteristics in a field shifting

out of universities into industry or vice versa. By Aright creativity characteristics@ I mean

funding that is big enough to get into the problem, and structured so that it enables the researcher

to focus on the problem without too many distractions. In addition, funding focus can move to

another geographic or national location, thereby moving creativity from one location to another.

With this understanding of creativity, let us return to the question left unaddressed at the

beginning: How does a creative university interact with its surroundings to produce one of the

bumps in the flat world?

This is a very complex question, and large scale studies of the economic impact of

universities on their region (see, e.g. Goldstein and Drucker[24]) give inconsistent answers to this

question, possibly because apples and oranges get mixed together to get a sizeable data base. In

addition, most studies use data that really predate the explosion of globalization, and the rapid

growth of the knowledge economy. However, since creativity stimulates creativity, most studies

do find that indices of creativity of the university, such as patents and research funding, do

positively correlate with the formation of these ecosystems, but in a very complex way. And

since such an ecosystem depends on the presence of creative people, the number of graduates of

the university and their focus on technology and business significantly positively influences the

ecosystem. I don=t know of any study that looks at it, but it must be important whether or not the

university is enthusiastic in playing a major role in the formation of the ecosystem. That is,

actively welcoming and supportive to the companies that enter the region.

There is also useful anecdotal information that comes from case studies of how businesses

are responding to globalization. Hagel and Brown[2] point out that these special ecosystems grow up around companies with complementary activities and a need to share knowledge. In addition, the region must also have business support structures grow up such as legal, marketing, etc firms, transportation infrastructure, etc. Berger notes that universities can be important in attracting and creating communities where Aintense face to face exchanges of knowledge are important@ such as silicon valley[3], and remarks the importance of proximity in being able to "fish from the research stream" of a major university[25].

Florida[5] notes that in the world as it is today, the more creative members of the workforce do not expect to stay at one company for a significant portion of their career. This means that career moves are increasingly horizontal, rather than vertical. As a consequence, creative workers are likely to congregate in those regions where there are many options for horizontal moves. Florida also finds that creative people look for cosmopolitan regions, large enough that they can find a peer group, and diverse enough to find stimulation and challenges. Thus, for most creative workers, place still matters, and in Florida's view, it is these creative workers (rather than industries or companies) who drive regional economic development.

But data show that not all regions are able to build those desirable creative ecosystems, even if there is a creative university or other driver of creativity present. Richard Florida=s research[18] indicates that the creation of a creative ecosystem depends on the presence of all three of what he calls the 3T's of Economic Development: Technology, Talent and Tolerance. Technology refers to the size and concentration of the region's economy in technology- intensive areas, while Talent is measured by the percentage of the population with a bachelor's degree or above. Tolerance relates to the way in which the region welcomes people with diverse

characteristics. Florida finds that his measures of tolerance are central to the question of whether

the community itself is open to creativity, and able to sustain it over time.

Obviously, universities can play a big role in creating the diversity and openness that

increase community tolerance, but there obviously are many other forces at play in defining an

environment. But Florida emphasizes the critical importance of this creativity-receptive

environment, and concludes[26] A many regions lack the talent and tolerance to compete at the

cutting edge.@ He believes that a major role of universities in the future must be engagement

with the community in order to create the kind of atmosphere in which creativity can thrive.

In any case, it is clear that the economic well being of the nation in this new era of

globalization will depend on our ability to build and maintain these learning regions, these local

ecosystems of creativity that prevent the world from becoming flat. Universities, to be part of that

game, need to assure that they are doing everything they can to encourage the creativity of their

faculty and staff, and need to produce graduates who are intellectual risk takers that can connect

the dots between different concepts. Universities need to be part of the community, working to

increase tolerance for different ideas and approaches. And, in addition, universities need to see

their role as one of active partnership with companies working at the cutting edge of their

domains.

Indeed, one can imagine that at the knowledge economy continues to grow in importance,

the importance of those intense face to face exchanges of knowledge that Berger talks about will

increase. That will open up exciting new opportunities for global influence for those universities

that learn how to position themselves at the center of a local ecosystem of creativity.

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