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# Supporting high growth entrepreneurs: The Network-Centric approach to entrepreneurial assistance

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## Executive Summary

It is no secret that entrepreneurship drives economic growth, especially in an economic downturn when job creation is key, thus pushing support mechanisms for high growth entrepreneurs to the forefront of economic planning agendas.

The notion of building regional and local clusters from the top down, mostly with the support of governments, has increasingly become established and prescribed policy around the world. However, new realities for entrepreneurship leave clusters in general, and incubators and science parks in particular, unable to fully address the needs of the globally competitive entrepreneur.

The global context, defined by information asymmetry, fast-changing market dynamics, low barriers to market entry, wide dispersion of knowledge and globally distributed talent and an inherently interconnected marketplace, is now the reality of high growth entrepreneurs. This new landscape allows today's high growth entrepreneurs both unprecedented opportunity and competition. They can, and should, operate in virtual collaboration with other entrepreneurs and larger companies across the globe to better understand and reach the extent of the market possibilities open to them from the very inception of the enterprise. Entrepreneurs now compete across geographies, in locations far removed from their home locations.

Within the context of this changed landscape, entrepreneurs need to be in-tune to global markets and opportunities to remain competitive. They need constantly updated market knowledge and competitive intelligence. Further, they must become aware of, and pursue, global opportunities and partnerships. This is best achieved by "just in time" access to domain and functional experts (such as those drawn from industry) and a set of resources on whom they can call whenever they need to do so (in a non-linear fashion). Given that an entrepreneur's time and resources are not enough to generate and maintain a comprehensive network of resources needed for an uncertain future, it is critical that entrepreneur support organizations operate under this network-centric perspective.

In contrast, cluster policy, characterized by an inward looking preoccupation with finding all the pieces and putting them together in situ, leaves resident entrepreneurs sheltered, less able and prepared to adapt to fast-changing circumstances, and results in missed opportunities that exist outside the region. The all too often linear education methods of clustered environments also does not allow for the timely deployment of situation specific resources tailored to an individual entrepreneur.

These critical gaps call for economic development organizations to adopt a methodology of support that is not dependent on a one size fits all approach but focuses assistance on practical, just in time strategies, that seeks to help identify and develop markets and partnerships for the entrepreneur well beyond the region, in a fluid, constantly changing, somewhat unstructured program, exposing entrepreneurs to the rough and tumble realities of the market with the support of resources/mentors who themselves, have been there.

## Supporting high growth entrepreneurs: The Network-Centric approach to entrepreneurial assistance

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### About the Paper

This paper asserts that the challenges and opportunities for high growth<sup>2</sup> entrepreneurs, particularly those in knowledge-intensive industries, in today's new global environment, call for a new paradigm of entrepreneurial assistance, a network-centric approach. This approach is more appropriate in dealing with the interconnected character of the new global marketplace. We maintain that training and assistance programs offered in "clustered" environments, including incubators, science parks and in the offerings of regional business clusters, on the other hand, are less well equipped to deal with the needs of the high growth entrepreneur in this new environment.

In making this argument, we first discuss cluster<sup>3</sup> development and marketing. Cluster development - also referred to as "agglomeration" by sociologists - constitutes a dominant paradigm of development, fostered and encouraged by governments around the world. These efforts have derived much of their inspiration from regions like Silicon Valley and San Diego. We then examine the landscape of innovation, the new, complex and rich global environment in which all entrepreneurs must operate. We seek to place the needs of the high growth entrepreneur in the context of these new realities, particularly in relation to their access to new markets and people resources - mentors, domain experts, partners and customers - who are necessarily quite dispersed, geographically and sectorally. We also assess how well entrepreneurial assistance in clustered environments (which anchors entrepreneurial success in local contexts) meets these needs and assists high growth entrepreneurs to minimize their challenges and maximize their opportunities, beyond the incentives provided in these environments. We expect, in so doing, to make a strong case for the use of a new network-centric assistance model, well aligned with the landscape of innovation and the needs of high growth entrepreneurs.

In this paper, we frequently refer to "clustered" environments. A new offering - "accelerators" - is still too new to be analyzed, though these share many of the characteristics of incubators and science parks. Some accelerators are focused on individual industry sectors that a particular region may seek to emphasize as being key to their competitive advantage. In all instances, we address the context of clustering, since it is the operative framework under which such components function. Our focus is the direct assistance provided to resident entrepreneurs (most often provided as part of

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<sup>1</sup> The author wishes to acknowledge the contributions and assistance of Michael Rudis and Nandini Taneja of Larta Institute in the preparation of this paper.

<sup>2</sup> A "high growth" entrepreneur is one of a group of entrepreneurs who, in the first five years of their entrepreneurial journey, go beyond the limitations imposed on them by size, create compelling revenue opportunities, and venture far enough to realize enterprise value, thus setting in motion a series of other beneficial developments in the broader ecosystem.

<sup>3</sup> A business cluster is a geographic concentration of interconnected businesses, suppliers, and associated institutions in a particular field. Clusters are considered to increase the productivity with which companies can compete, nationally and globally. (Porter 2000, 15)

the incentives offered in these environments). One classic feature of clustered environments is that they offer training programs that use in situ trainers, mentors and resources, for reasons which are easy to understand and which we discuss shortly.

This is a work in progress. Mapping out the model and surveying the work of clusters and incubators, which are considered by many governments and economic development professionals as linchpins of development, needs to be further developed. This is especially important given that the promotion of cluster policy and development - along with incubators and science parks - represents a remarkable convergence of enthusiasm, hope and policy between economic development professionals, politicians, political economists, sociologists and some economists. The good news is that there is an increasing amount of work being done that seeks to analyze the effectiveness of clusters in general, and individual components like incubators in particular, though specific case studies of Silicon Valley, Route 128 in Massachusetts and a few others, have been featured in the literature for many years.

This paper is relevant both to practitioners managing innovation agendas in entrepreneurial support organizations and to policymakers who provide the direction and incentives for innovation-based economic development<sup>4</sup>. For the most part, it is derived from the experience of the author and the work of Larta Institute (Larta) over its two decade-long existence. Larta is a not-for-profit global commercialization company that works with entrepreneurs, mentors, investors, and channel buyers in seeking to build a more flexible and responsive ecosystem around high growth entrepreneurs.

In this paper, we feature real-world perspectives from high growth entrepreneurs who have participated in Larta's Commercialization Assistance Programs (or CAPs)<sup>5</sup>. These CAPs include in-person and face to face interactions, but much of the assistance is conducted virtually (remotely), recognizing that assets, resources and expertise are dispersed across multiple geographies around the globe.

### **Regional Clusters, Cluster Development and Cluster Policy: An established paradigm of development**

In the late 1990s, Michael Porter's book, *The Competitiveness of Nations*<sup>6</sup> spawned a large and growing culture around cluster development and cluster policy. Regions increasingly turned to (and continue to do so to this day) well-worn templates that promise to provide "cluster mapping" and "cluster building" pathways. The notion of building regional and local clusters from the top down, mostly with the support of governments, has increasingly become established and prescribed policy around the world. Indeed, it is argued, clusters are natural and rational responses by collections of

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<sup>4</sup> This is sometimes referred to as "technology based economic development" or TBED, especially in the U.S.

<sup>5</sup> The Commercialization Assistance Program (CAP) has been developed as a mass-customized, hands-on approach to entrepreneurial training to help transition publicly funded R&D to the marketplace. Since 2005, Larta has facilitated 456 strategic introductions on an annual basis, \$542M has been raised by 198 companies, 286 companies have created 1804 new jobs, and 15 companies have been acquired.

<sup>6</sup> This was the book that first presented and developed the theory of clusters as a principal tool to enhance competitiveness.

firms in a given area. Conversely, the lack of clusters or their failure to emerge is considered to be “coordination failure,” i.e. the failure among firms to coordinate activities, align interests and develop a model of rational, organized economic choice that leads to clear and positive economic outcomes. This is used as justification by governments to intervene to correct this perceived failure (Glăvan 2008)<sup>7</sup>.

Growing high value enterprises in clustered environments is considered a highly desirable outcome in economic development. Without the returns that such entrepreneurial firms provide, in terms of jobs and wages, revenue and taxes, there will be no spillover effects of knowledge, support for cultural and educational assets, social and professional networks or business institutions. Groups of these entrepreneurial firms, anchored in local communities, bolstered by resources that are provided locally, are thus considered essential to the continued growth and competitiveness of these communities. In the U.S., promoters include many regions like the Ann Arbor area in Michigan, the U.S. Economic Development Administration (EDA) and the Small Business Administration, and globally, multilateral organizations like the World Bank and OECD routinely prescribe clusters as essential components of economic development strategy. Clusters in general and incubators and science parks in particular, are put in place around universities and research institutions. The latter are considered key to catalyzing innovation in these regions and thus as the “feedstock” for entrepreneurs.

### *Incubators and Science Parks – Handmaidens of Cluster Theory*

Incubators and science parks, as we have mentioned, have also taken hold in the top down cluster development model of economic development. While these components have been in existence on their own for some time<sup>8</sup>, they are increasingly considered important to the mapping strategies and funding incentives in many countries. Public investment has flowed to the development of clusters, incubators and science parks. Incubators, in particular, are now being built across the world, many with public money<sup>9</sup>, and while they have widely different aims and apparently follow distinct and different models, the practice of incubator management now has its own, equally well-worn pedagogy. Many countries around the world - and they include both developed and developing countries - regard incubators and science parks as both a panacea for their own market underachievement (and a way to address this) and as tangible, visible tickets to success. As such, they are also often closely tied to real estate development and “revitalization” efforts promoted by governments and the development community.

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<sup>7</sup> This paper provides an excellent discussion of the issues associated with both cluster theory and the theory of coordination failure. It refutes the claim that an inability of clusters to emerge is a coordination failure and therefore a ground for government intervention.

<sup>8</sup> The first incubator was founded in New York state in 1959 and the notion of science parks takes its inspiration from organically-derived efforts in Silicon Valley in the 1940s and 1950s, around Stanford University.

<sup>9</sup> A very recent example of this is the \$8.2 million grant given to the University of Florida to build a new incubator for high-tech entrepreneurs and innovators called the Florida Innovation Hub which opened its doors January 11, 2012. The grant was given as part of the Jobs and Innovation Accelerator Challenge by the Obama Administration in collaboration with The Commerce Department’s Economic Development Administration (EDA) and 15 other federal agencies.

Both clusters and their offspring, incubators and science parks, are focused on deploying a model of entrepreneurial support and assistance that anchors entrepreneurial success in local contexts. They all operate under an underlying imperative: to mimic or aspire to the success of Silicon Valley. (This has had, and continues to have, unintended comic effects. To wit, the fervent efforts of regions around the world to adopt “silicon” and/or “valley” as brand monikers to define their identity range from Silicon Prairie, Silicon Alley, Silicon Desert, Silicon Mountain, Silicon Fen, Silicon Wadi to Motorsport Valley, Medicon Valley, Optics Valley etc.<sup>10</sup>).

*Cluster objective - a “complete” ecosystem*

In effect, the key objective of cluster efforts is the growth of an entrepreneurial ecosystem that is more “complete” and more desirable than others. As such, they are thus inherently inward-focused<sup>11</sup>. This is ironic, because the object of their mimicry, Silicon Valley, is, in fact outward- focused: externally linked to markets and business interests that span the globe. One enduring example of this is the relationship (and the people connections) between Silicon Valley and Bangalore, starting at the height of the outsourcing boom in the early 2000s. It is possible that organically developed regions like Silicon Valley are more outward-focused than what may be referred to as the “manufactured” clusters looking to mimic them.

For the latter, the entire complex of incentives (from state and even federal governments, sponsorships by local service providers, such as financial services, law, accounting and real estate firms etc.) is focused first, on the development of the cluster’s value proposition to itself, and then, on the assertion of its relevance in competition with other clusters that often have precisely the same orientation, structure and incentive scheme. In their dependence on such incentives, cluster operations will necessarily use members of local service providers as mentors, trainers and advisors, both as a reward for their sponsorships or support, and to connect them to emerging entrepreneurs (enrolled in their training programs), who are in effect business prospects. This provides a strong motivation on the part of cluster managers to enroll resident entrepreneurs in these programs.

*Organically-developed clusters: idiosyncratic and serendipitous*

It is important to note that what signifies the organic development of a cluster in a region, as in Silicon Valley and, more recently, San Diego, is an explosion of entrepreneurial talent as the result of highly localized, one-off developments such as the implosion of, mass migration from, or acquisition of a major local firm. As such, serendipity plays a big role. The implosion of Fairchild Semiconductor in Silicon Valley

<sup>10</sup> These are located in the U.S. Midwest, New York City, Southwest, Colorado, Cambridge, UK, Israel; Germany, Denmark and France respectively.

<sup>11</sup> A recent example of this is Applied Sciences NYC: an initiative to build or expand a world-class applied sciences and engineering campus in NYC seeking to dramatically expand capacity in the applied sciences to maintain global competitiveness and create jobs. The goal of New York City’s Economic Development Corporation: “Increase the probability that the next high growth company—a Google, Amazon, or Facebook—will emerge in New York City and not in Shanghai, Mumbai, or Sao Paulo.” <http://www.nycedc.com/project/applied-sciences-nyc>

(the departure of key members of the team) led to the founding of Intel in 1967. Earlier, the Valley was home to Bill Hewlett and David Packard, whose work with the legendary Prof. Frederick Terman led, idiosyncratically, to the founding of one of America's iconic entrepreneurial companies (Saxenian 1994). Even as late as the early 1990s, however, Silicon Valley itself was still relatively sleepy and quiet. It vaulted into prominence as a result of the dotcom boom, starting with the rise of Netscape (birthed in Champaign-Urbana, Illinois), leading to significant speculation and large amounts of investment capital raised (this was the beginning of the era of cheap money) and the subsequent explosion of consumer-centric computing and social media. This was the time when the mythology of Silicon Valley was born, many years after such local luminaries as Sun and Apple first appeared. The area itself, despite its overweening tendency to excess, is also a testament to interlocking networks, powered in great part by immigrants from India and China<sup>12</sup>. Silicon Valley is exemplary of network-centric operations, at all levels.

In San Diego, the acquisition of Hybritech by Eli Lilly resulted in the sudden appearance of a host of millionaires and an explosion of private investment in start-ups that, in turn, have led to a vibrant life sciences industry.

In both places, motivated entrepreneurs, bred in the sciences and catching the sails of a sudden, chance occurrence, became legendary icons in their communities and spawned a local culture of innovation. Certainly, the impetus created by these occurrences sparked a range of activities and led to the development of supportive infrastructure in both places, but these grew organically from their experience. Interestingly, both regions are anchored by a dominant university (Stanford and UCSD, respectively) which was both academic guide and sometime entrepreneurial organizer. Their roles in their respective regions has led to the imperative on the part of economic developers that mandates the inclusion of a university in manufactured cluster development efforts.

The important point here is that these two "clusters" sprung up organically, as a result of specific occurrences that gave rise to a range of actors and activities linked by shared experiences, but were not specifically focused on institutional structures or the development of entrepreneurial training programs. Neither one of them saw the intervention of government in the development of their clusters or the prescription of elements that needed to be put in place.

But, the question arises, especially among governments who are keen to take the experiences of their most worthy citizens in "fortunate" regions and apply a dose of intervention to, and in, the rest: while spectacular success in certain regions has indeed been provoked by chance occurrences and local circumstances, are there a set of codified principles that could be derived from those experiences, and that, if practiced routinely, would result in the same outcomes being generated elsewhere?

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<sup>12</sup> This has led to a predictable moniker of its own – Silicon Valley INC., where INC. is an acronym of "Indians (A)N(D) Chinese"

Before we address this question, we should note that the global environment and backdrop in and against which regions operate today is marked by a global dispersion of talent, technology, investment and available markets. While all regions are embarked on a sometimes fierce competition for foreign direct investment (FDI), their entrepreneurs - the catalysts for regions' efforts to project relevance on a global stage - are clearly able to take advantage of a richer global environment, where "virtuality" is increasingly as much a driver of economic value as location-based incentives.

*The Challenge for Clustered Environments: Inward-focused practices and perspectives*

Cluster *development* can play a role in helping regions understand their own trajectories of growth and competitiveness, just as the sharing of best practices in many business and other contexts provides "lessons learned." It could (and should) focus regional actors on a region's R&D and intellectual assets, the foundation for knowledge-based industry. It may further focus attention on gaps and on strengths and opportunities that could be exploited and used to develop a clear (albeit shifting) picture of where a region stands in relation to a global value chain.

However, cluster *policy* often dictates a basket of practices that limit its practitioners' perspectives and orientation, causing them to adopt inward- focused practices and preventing them from connecting their entrepreneurs to the realities of the world outside their constrained environments. This is then reflected in the kind of training, assistance and incentives they provide to their entrepreneurs, which we discuss in detail below.

Further, given extraordinary changes in the landscape of innovation that have occurred in the past 15 years, and more so in the past decade, such an exercise in inward-focused *development*, taking its cue from an organizing principle of mimicry of successful regions, specifically Silicon Valley, is neither sustainable as a holistic practice nor desirable for the high growth entrepreneurs found in these environments. Worse, cluster policy may also lead to a false sense of regional or local value being inculcated among economic development practitioners in many clustered regions, that may not be warranted by market realities affecting their entrepreneurs and may make them increasingly dependent on a wide scheme of (mostly government) incentives focused on such initiatives. In effect, this is what has occurred in so many clustered environments, ranging from Alabama to Florida, from Colorado to Idaho and from Illinois to Mississippi, where a "me too" expression of regional value does not lead to any greater relevance than if they never had adopted a cluster framework to start with.

Given the constant shift of economic activity between regions across the world in the new global environment, the *agglomeration* of resources in regions may constitute a *rational* response to global competition, but clusters go beyond this imperative. They seek to construct – or at least hold open the prospect to do so – as complete a resource environment as possible in their regions. While explicable in the context of local sponsors and local motivations, this is unrealistic given the increasingly globalized environment in which they operate, and causes the development of a dangerous inward-focused *perspective* on the part of cluster managers, trainers and program

developers. And while the global landscape of innovation has outpaced the capacity of individual regions and countries to “corral” the innovations demonstrated by their best entrepreneurs, marketing campaigns orchestrated by and/or on behalf of clusters and their government sponsors often seek to perpetuate the plausibility of complete, *in situ* development in these regions.

To be sure, many regions work towards the building of clusters as a response to great economic challenges, the chief among them being to develop a working network of resources that would focus on diversifying their economic base. With or without the envy generated by the experience of Silicon Valley, such a response itself, in general, suggests a rational and reasonable objective— to put one’s house in order, so to speak, and to prepare it for, say, the next 20 years. But the question that must be asked is: given the distributed nature of innovation in a fast-paced global environment, what kind of assistance do they need to provide, especially to their high growth entrepreneurs, to maximize the spillover effects that they can generate for their communities, their regions, their economies?

Clearly, the incentives in place provided by a state or region, motivated to choose a course of action that “puts one’s house in order” often may be attractive enough to keep the high growth entrepreneur interested and willing to participate in the training programs and interact with local mentors and other service provider resources offered in a clustered environment. But without a continued reference to (and addressing of) the concerns that will keep these high growth enterprises vital, competitive and growing, a preoccupation – and a common, observed desire – to focus on finding all the pieces and putting them all together *in situ*, risks leading the region or state into a trap of not knowing, first, what exists *ex situ*, and second whether the things that do exist could be a threat or a boon.

A recent study<sup>13</sup> that analyzed data from clustered and non-clustered environments found no significant performance differences in the early stages of the industry life cycle. However, non-clustered firms outperformed clustered firms in the late stages of the industry life cycle, even during economic contractions (Kukalis 2010). This is further supported by a study<sup>14</sup> that reveals “that the effects of incubation are potentially deleterious to the long-term survival and performance of new ventures.” (Amezcuca 2010, 33). This suggests that clustered environments may operate as *sheltered* environments, leading to inward-focused practices. Aldrich (1999) refers to *competency traps* that prevent companies from adapting to external competitive pressures when they have been *protected*, as they are in these environments. The reported results of these studies, in combination with concerns raised by a few scholars of agglomeration, suggest that the enthusiasm for cluster theory shown by scholars, practitioners, and policy makers may need to be tempered.

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<sup>13</sup> This study looked at thirty-one years of performance data for 194 firms from the semiconductor and pharmaceutical industries to understand the relationship between agglomeration economies and financial performance.

<sup>14</sup> This study looks at whether having been incubated helps new ventures survive and grow in the long-run using a nationally representative sample of incubated firms and a matched control group of non-incubated firms.

It is interesting that the father of cluster theory and its most visible and successful protagonist, Michael Porter, himself acknowledges the limited scope of clusters: “Under certain circumstances,” he writes, “cluster participation can retard innovation. When a cluster shares a uniform approach to competing, a sort of groupthink often reinforces old behaviors, suppresses new ideas, and creates rigidities that prevent adoption of improvements. Clusters also might not support truly radical innovation, which tends to invalidate the existing pools of talent, information, suppliers, and infrastructure. In these circumstances, a cluster participant might be no worse off, in principle, than an isolated firm (because both can outsource), but the firm in an established cluster might suffer from greater barriers to perceiving the need to change and from inertia against severing past relationships that no longer contribute to competitive advantage.” (Porter 2000, 24)

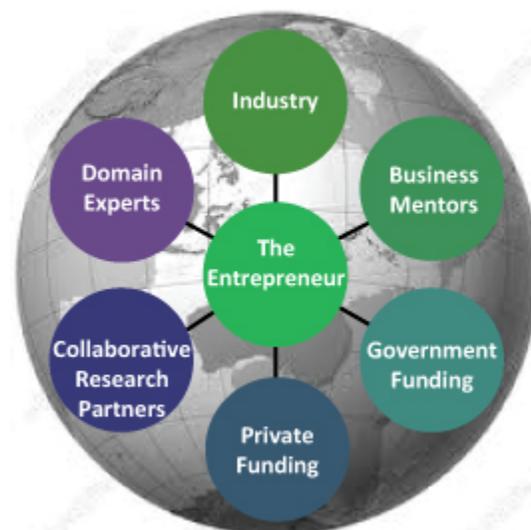
This note of caution is applicable across a wide swath of clusters, in the U.S. and around the world and could and should be extended to groups of clusters.

### **The Landscape of Innovation: Constant Change and Dynamic Markets require Non-Linear Approaches**

The current global context for entrepreneurs is characterized by information asymmetry, fast-changing market dynamics, low barriers to market entry, wide dispersion of knowledge and globally distributed talent. “Innovations that sustain modern prosperity have a variety of forms and are developed and used through a massively multiplayer, multilevel, and multiperiod game,” writes Amar Bhide in his celebrated book, *The Venturesome Economy*<sup>15</sup> (2008, 9). On multiple levels, involving multiple players and through multiple iterations, high growth entrepreneurs must possess heightened global awareness and institute rapid, global responses to challenges and opportunities they face in an increasingly networked world. The extraordinary growth, especially in science and technology, of China and India in Asia, Chile and Brazil in South America, among a host of other countries, and the rapid development of entrepreneurial firms and market structures in these countries underscores the opportunity and challenge for today’s high growth entrepreneurs, regardless of where they are located.

#### *The Global Imperative for Entrepreneurs*

Increasingly, today’s high growth entrepreneurs can (and should) operate, in virtual collaboration with other entrepreneurs and larger companies across the globe. This could help them



**Figure 1: The entrepreneur in the global ecosystem**

<sup>15</sup> Bhide discusses the role of “mid and ground-level innovation,” and argues that being closer to end-customers (wherever they may be) is critical to the success of business ventures, within the broader framework of how globally developed innovation enhances prosperity in the U.S. The book uses extensive field studies to advocate for the globalization of technological innovation, demonstrating that an appetite for “venturesome consumption” is more important than the source of the research.

understand the reach and extent of the market possibilities open to them from the inception of the enterprise. They also need to solicit and receive feedback from potential customers and users in the markets they need to address. Armed with this understanding, they will be in a better position to address new markets while overcoming gaps through partnerships. They will also be better able to develop new, derived innovations, without the overhead expense and landed investment that conventional businesses frequently employ. Consider the Indian software industry. It has inculcated a remarkable peripatetic quality in its member companies such as Wipro and Infosys, that developed similar, virtual business models early in their development and have grown to become large, competitive global companies in a relatively short period. In turn, these fast-growing capitalist (not state-owned or operated, as say, in China) enterprises have influenced a whole network of specialized IT consultants, outsourcing companies and virtual enterprises that are setting out to transform the way, for example, architectural drawings are prepared or legal briefs and legal research are developed or business services delivered across the world, driven both by lower cost and fast turnaround times, operating on the Web.

*A Networked Environment is the Hallmark of the Landscape of Innovation*

The growth of interdependence, of a networked environment that defines a “network” more broadly than was necessary or essential in a previous age, has been facilitated by the reduction in communication costs wrought by the Web and by the development of online tools. It has been accompanied by a lowering of the barriers to entry, especially for emerging entrepreneurs. High growth entrepreneurs now compete across geographies, and their products and services need to be constantly and continually refined to meet changing market dynamics in locations far removed from their home locations. Their awareness of the changing “state of the science” and “state of the art”, as reflected in a worldwide landscape, is vital. Whether the product or service is an Internet business model or a set of tools to diagnose and detect disease, innovations, even disruptive ones, are being developed faster than ever before.

This dynamic landscape also enables today’s high growth entrepreneurs to seek out the expertise they need (both domain and functional) “just-in-time<sup>16</sup>”, and to obtain market and customer intelligence from advisors and experts across the world, in short, to build a network of resources on whom they can call or which they can employ when they need to do so. This enables them to stage, refine and scale their offerings – e.g. a prototype or an initial service model - based on such intelligence, *without having to follow a linear, curricular approach to enterprise-building*. Also, this networked environment is increasingly a *virtual* one i.e. requiring less face-to-face interaction, and provides the high growth entrepreneur with a wider pool of mentors, advisors, partners and collaborators than would be possible in any specific geography.

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<sup>16</sup> Just-in-time" refers to the practice of selecting and/or deploying resources that are needed at a specific time for a specific pre-determined outcome, and possibly at no other time. Larta Institute uses this term - and this practice - in its commercialization assistance and training programs.

Having access to this wider network often makes a great difference, early on, to the emerging high potential entrepreneur. Take the case of Z4 Energy Systems<sup>17</sup>, a participant in one of Larta's Commercialization Assistance Programs (CAP), which has developed a novel wind turbine blade design. They faced a serious issue when they enrolled in the CAP: most manufacturers of wind turbines had their own blades. This was not an issue that the Company's mentors, drawn from inside the incubator in which they were resident in Laramie, Wyoming, could help them overcome. While they offered operational advice, they had little or no hands-on experience in the fast-moving marketplace of wind energy. Laramie, Wyoming, is a small community, and lacks many of the components of an innovation ecosystem. The outcome for this small company in a low-visibility region: using the network-centric approach employed in Larta's CAP, it was able to tap wide-ranging expertise, refine its value proposition, find receptive collaborators and work toward acquiring a higher-end customer, far removed from where it was located, an outcome that was otherwise foreclosed to them. The point here is that the nomination of people resources to a high growth enterprise must necessarily follow market need, expressed by the objective reality of the high growth entrepreneur's specific situation at a particular moment in time, regardless of their physical location. This is best done via a networked organization; it can pull from a wide network of people who have domain, functional and market experience, often are involved out of self-directed interest and may be called on to counsel, guide or otherwise help the high growth entrepreneur when needed (just in time). We refer to this as the network-centric approach. (See Figure 2 for a graphical representation of the network approach.)

### *Supporting Organizations are vital*

Also, as important to this network-centric scheme of innovation, high growth entrepreneurs need supportive organizational infrastructure - entrepreneur support organizations - that are able more effectively to manage an increasingly geographically and sectorally dispersed networks of people resources and assets, and could do so on behalf of a group of such entrepreneurs, none of whom could credibly recruit these resources on their own. Such organizations should command credibility with a range of such advisors, partners etc. and thus facilitate interactions and transactions as necessary. These "networked organizations" are appropriate to the highly fluid, non-linear landscape of innovation operating today. We discuss the structure, work flow, objectives, and linkages established by these supportive organizations in further detail below (also captured in Figure 2).

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<sup>17</sup> Z4 Energy Systems operates in the small wind energy sector. The company was a participant in Larta's 2010-2011 USDA-Commercialization Assistance Program.

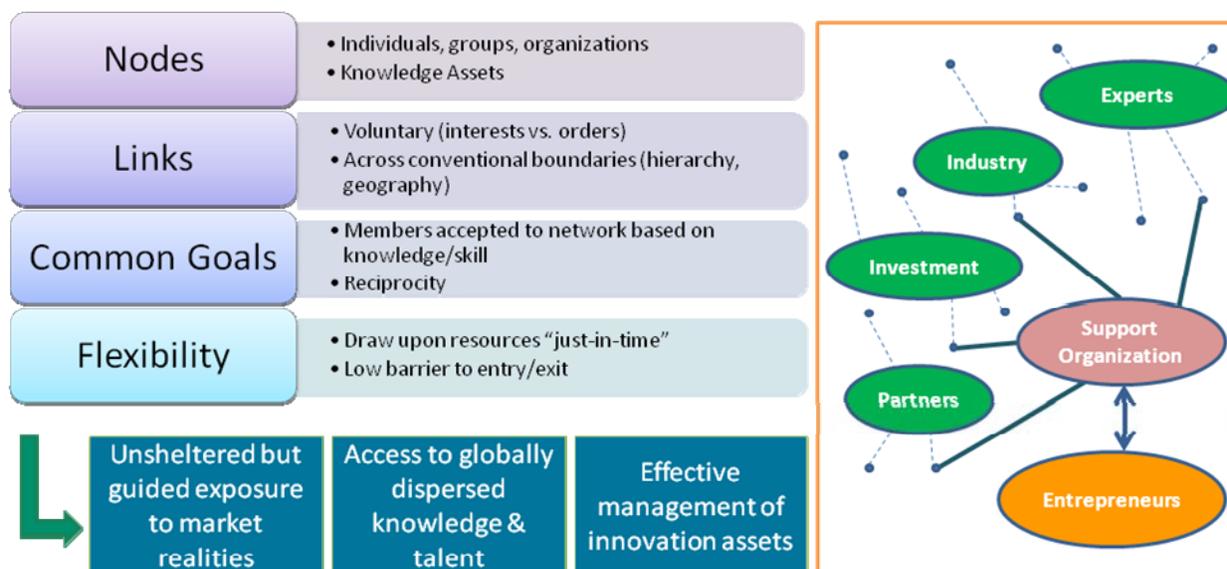


Figure 2: Networked organizations in the context of entrepreneurial support

## The Needs of the High Growth Entrepreneur

So, against a backdrop of fast paced, constantly shifting market dynamics, the high-growth entrepreneur needs:

- Constantly updated market knowledge
- “Just in time” access to domain expertise regardless of where it is located; and
- Customer and competitive intelligence, often minutely and, again, constantly calibrated.

Further, he must:

- Pursue discussions and, potentially, ink agreements with, partners that will help him build scale or address niches, as the case may be;
- Address markets unknown or difficult for him to penetrate easily without a major commitment of scarce resources; and
- Generate funding from a variety of inputs outside traditional, less universally accessible sources such as venture capital.

Neither the entrepreneur, acting on his own, or in clustered environments, nor the professional staff or organizations devoted to the building and management of a clustered environment, where the entrepreneur is resident, can be expected to command all of these resources, to have the expertise and/or the key insights in specific industries or ancillary ones, or, indeed to fulfill these imperatives in and from their own regions exclusively. The continued interactions and relationships that develop through the entrepreneur’s progress to the market are best expressed through a networked organization model, as we discuss in greater detail below.

A recent study<sup>18</sup> on the interaction of Norwegian firms found that those that interacted mainly or exclusively in the local context were less innovative than those with multiple global partners. Those with a “diversity of international partners,” the study found, “created more radical innovations.” (Fitjar & Rodriguez-Pose 2011, 2) [Norway may be seen in this context as a proxy for clustered environments: localized, grouped in a relatively small geographical area by industry, with provisioning of local resources being brought to bear for the benefit of the region’s companies].

Finding global partners is a vital objective for today’s high growth entrepreneur. Addressing markets that would otherwise be difficult to penetrate becomes easier with well-constructed partnerships. “Bundling” one’s offering with components of partners’ products or services promises to help build scale. Being aware of the changing IP and enhancements being offered in one’s field, wherever that may be, may enable greater adaptability to a dynamic marketplace. Mark Wiederhold of Virtual Reality Medical Center (VRMC)<sup>19</sup>, a participant in Larta’s CAP, recognizes that too few places are able to offer international resources, and in today’s world, internationalization is crucial and cannot be ignored. Being located in San Diego, there is a strong local cluster and support ecosystem, and it would have been easy for him to remain well-networked with regional resources and opportunities. However, he quickly recognized, especially in light of his experience in the CAP, that today’s entrepreneur competes in a much more “comprehensive” world, and also has access to many more international resources that can, and should, be leveraged. Not only “talking the talk” but also “walking the walk”, much of VRMC’s success can be credited to the connections he sought to build throughout Europe and Asia.

Geoffrey Jacquez, CEO of BioMedware<sup>20</sup>, one of the entrepreneurs participating in Larta Institute’s Commercialization Assistance Program (CAP) offered to National Institute of Health SBIR grantees, knew instinctively that he lacked an understanding of the potential customers across the wide geography pertinent to his business, and that he needed exposure and connections to the “rough and tumble” marketplace outside his cluster. He also realized that the training offered in the clustered environment of the ‘research corridor’ around Ann Arbor (whose intention was to build a cluster to emulate Silicon Valley and San Diego) was, for the most part, weak and not helpful. Specifically, he says, there was no exposure to the wider networks he needed, and no expertise that was global enough to give him an understanding of his commercialization “roadmap.” Through his participation in the CAP, he was able to “operationalize stuff ...that I should have done a long time ago”. Effectively, he says, his time spent in the cluster would have been better spent connecting (being connected) actively with resources far from

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<sup>18</sup> This study looks at the sources of firm innovation in urban Norway. The results demonstrate that firms with a more international outlook innovate more, and innovate more radically when compared to firms that interact with local or national partners.

<sup>19</sup> VRMC currently uses virtual reality exposure therapy in combination with physiological monitoring and feedback to treat panic and anxiety disorders. The company was a participant in Larta’s 2007-2008 NIH-Commercialization Assistance Program.

<sup>20</sup> BioMedware is a research and development company whose developing tools for exploring relationships between human health and the environment. The company was a participant in Larta’s 2008-2009 NIH-Commercialization Assistance Program.

his home base and refining his offering in light of the intelligence he would have gained from experts drawn from a network that was widely distributed.

Jacquez credits the non-linear training approach offered to him by the CAP's "network centric" program for the dramatic increase in his revenue and contact base. "As a result of reaching out and searching beyond our region for an understanding of potential customers, we have expanded our access to both potential clients and new markets," he says. Crucially, he is quite clear that he could not have done so on his own. This points to an important role for entrepreneur support organizations, who often are able to provide the entrepreneur with the imprimatur of credibility.

To summarize, entrepreneurs need: to socialize, to participate in knowledge-sharing networks, to connect to people in the field that will help them sharpen their skills and abilities to take on the markets, customers and partners they need. As Vivek Wadhwa<sup>21</sup>, academic, researcher, writer and entrepreneur, puts it, "it takes people who are knowledgeable and willing to take risks. These people need to be connected to each other...through information-sharing social networks" (Wadhwa 2010).

### **The Problem for High Growth Entrepreneurs in Clustered Environments**

We have discussed how clusters develop inward focused perspectives as the result of deliberate efforts directed at building the cluster (or incubator). This focus often prevents engagement by cluster and incubator managers with the external market (let alone other clusters). Thus they often do not employ the just-in-time resources needed to deliver to their entrepreneurs globalized market intelligence on changing customer needs and marketplace preferences, vital in an environment of global dispersion of talent and resources.

Entrepreneurs dependent on clustered or incubated environments become, instead, "cloistered", less able and prepared to adapt to fast-changing circumstances and other marketable innovations created elsewhere. As the study from Norway uncovered, (see above), firms without access to, and involvement with, a broad engagement externally, may be, in fact less innovative. Amezcua puts it well in the context of entrepreneurs in an incubator: "The early advantages given to incubated businesses might lead entrepreneurs to believe that running a successful company is easier than it really is when no assistance is being provided. Therefore, entrepreneurs may give less attention to addressing problems that the incubator by the nature of its services reduces." (2010, 10)

The key danger that we have highlighted is the operation in clusters of a sheltered environment that becomes a "cloister" for the high growth entrepreneur: dependent on hard incentives such as cheap facilities and guaranteed loans (SBA's CDC/504 loans

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<sup>21</sup> Vivek Wadhwa is a Visiting Scholar, School of Information, UC-Berkeley; Director of Research, Center for Entrepreneurship and Research Commercialization; and, among other accomplishments, Distinguished Visiting Scholar, Halle Institute of Global Learning, Emory University who has done significant work on clusters as an entrepreneurial support and economic development tool.

for e.g.), and not paying attention to activities or steps that need to be taken early in his life cycle.

Over the past 15 years, Larta Institute has studied entrepreneurial training programs in many parts of the world (specifically, the U.S., Asia, Europe and South America). Few of these programs measure their effectiveness against the measures of global value for their entrepreneurs such as finding partners, developing new markets and licensing technologies. Most instead focus on numbers - of entrepreneurs trained, projects and sectors covered. We have also worked with scores of entrepreneurs who have been in clustered environments, including incubators. Many of them discover, later than they should, that they have simply not dealt with critical factors affecting any modern high growth enterprise: their markets, their competitive profiles and their visibility to potential customers and partners. Certainly, they have plans, and Power Point pitches, and revenue and financial forecasts; but rarely (if ever) have these been validated by close (though virtual) contact with market actors - whether as advisors and mentors or partners and customers. The notion of a feedback loop providing constant inputs, and helping the high growth entrepreneur accelerate commercial outcomes is not in use in clustered environments. This has to do with factors we have already addressed. These include rewarding (and occasional recompense for) local supporters, sponsors etc., corralling a local pool of entrepreneurs as business development prospects for sponsors, seeking to build (often from scratch) a complete resource environment, as a response to federal incentives designed to assist communities to build clusters.

#### *Clustered Environments Do Not Meet the Needs of High Growth Entrepreneurs*

We have discussed how today's high growth entrepreneurs need to connect to people beyond the confines of their regions. They need to seek guidance from advisors and mentors across widely dispersed geographies, feedback from potential customers and users, be visible to and find partners, and be attentive to constantly changing market dynamics.

For the entrepreneur support organization, it takes great effort to adopt a methodology of support that is not dependent on a one size fits all approach, that focuses training and assistance on practical, just in time strategies, that seeks to help identify and develop markets and partnerships for the entrepreneur well beyond the region, in a fluid, constantly changing, somewhat unstructured program. It is no surprise that it simply is not in great evidence in clustered environments.

The fact is that most of them do not employ the just-in-time resources needed to deliver to their entrepreneurs vital globalized market intelligence on changing customer needs and marketplace preferences. All of them offer "webinars", web-based seminars on topics and subjects of general interest to the entrepreneur. Some of them offer local pow-wow sessions with mentors who critique their marketing, technical, revenue or other plan. But we have not found any that offer regular feedback sessions to seek out advisors, mentors, and others drawn from industry (for the most part) who can give them practical counsel grounded in shifting market realities. Instead, they develop

curricular programs that, as we have noted, tend to focus on a linear life-cycle approach in their work with high growth entrepreneurs.

The latter, in taking advantage of the incentives provided in a clustered environment, are also likely to enroll in training programs provided in these environments (even when they are not made mandatory, as is the case in some incubators). In following the mostly curricular precepts of the training programs provided in these environments, they may postpone valuable and essential activities that they must pursue in a non-linear (non-sequential) way from the inception (and conception) of the enterprise. These activities include:

- developing a comprehensive, constantly refined commercialization roadmap
- developing a real world competitive matrix, informed by shifting market intelligence, derived from expert mentors with knowledge of those markets;
- seeking feedback from potential customers and partners, without placing a “deal” on the table;
- identifying and communicating with other entrepreneurial firms that may have components that can provide incremental value to their own offering and so on.

Mark Wiederhold of Virtual Reality Medical Center says that while the training program he was enrolled in offered access to a lot of local expertise, it was too standard. Specifically, in one case, a capital strategy became a push for venture capital,<sup>22</sup> which was neither appropriate nor needed for his stage and product orientation. Indeed, capital strategies courses taught or critiqued in pow-wow sessions and/or in many entrepreneurial programs present venture capital as a default strategy, despite its inapplicability to the vast majority of companies and its well-established preoccupation with companies further up the food chain. This is but one example of the curricular approach in action.

Often, as we have seen in our own work with high growth entrepreneurs, they are capable of scaling across multiple geographies and of generating enterprise value by developing collaborative arrangements (for example, additional research, milestone-based product development) with larger enterprises, benefit by being visible to partners to whom they may not have otherwise had access (or may not even be aware of).

Yet, we are regularly witness to high growth entrepreneurs from clustered environments (we have presented examples in this paper) who have spent valuable time in curricular activities, divorced from the realities of their markets. Geoffrey Jacquez of BioMedware, Georgia Gayle of Z4 Energy Systems, Mark Wiederhold of Virtual Reality Medical Center, are a few of these entrepreneurs who discovered that there were critical, real connections to resources delivered through a network that they should have pursued much earlier.

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<sup>22</sup> It is, or should be, a matter of some concern that venture capital, an increasingly rarified source of funding for entrepreneurs, given a variety of specific limitations it imposes, including anticipated returns, exit requirements, etc., should be as predominant in the provision of training to entrepreneurs everywhere, especially in clusters and incubator environments. Our discussion with incubator tenants over many years suggests that they are encouraged to venture for venture capital, an experience that is frequently arduous and disappointing.

## **A new Paradigm: the Concept of Non-linearity, applied to entrepreneurial training**

The notion of non-linearity is both simple and breathtakingly complex. At its simplest, the term refers to the (somewhat chaotically arranged) aggregation of activities, inputs, people, and processes that operate around the entrepreneur – what Bhidé refers to as “a massively multiplayer, multilevel, and multi period game.”<sup>(9)</sup> The inputs are varied: from the coverage of competitors and competitive (or simply extant) innovations that serve the market need which the high-growth entrepreneur wishes to target - and of which he needs to keep close track, because they are changing more rapidly in the new global environment than in previous times – to the availability of a novel addition to his own innovation, available as a consequence of a discussion with another entrepreneur in a distant geography who is addressing a different issue or problem. People-to-people connections, increasingly across geographies and across disciplines are essential to the massively multilevel game of innovation. This is especially true as the sciences are increasingly integrating, and the effects of developments in one discipline are likely to have both intended and unintended consequences in another.

At its most complex, non-linearity in entrepreneurial assistance is closely associated with chaos theory. It suggests that in any given period of time, an entrepreneur will confront many variables, which cannot be addressed as a linear combination of independent components.

Thus, a training program that seeks to train an entrepreneur in, say, IP management, will necessarily have to address marketing, negotiation, partnership development and media, because the considerations that go into IP management involve many of these other inherently non-related items whose influences are important because they are best addressed simultaneously, and not, as is often done, sequentially. Such training would also seek to provide an understanding, or seek to examine, what exists in other markets across the globe that may be either a threat or helpful for the entrepreneur to consider, for example, potential partnership or licensing strategies. However, most training programs aimed at entrepreneurs will address these items as separate components of a modeled curriculum. In this case, he or she may be exposed to these issues through a specialist in IP issues, without any exposure - “training” - in how these real IP issues are also being affected by, or affecting other issues that are pertinent to their competitive profile, as outlined above. Thus, in these settings, entrepreneurs learn these concepts in a pre-ordered curriculum set, not as they are likely to experience them in their everyday work. A dynamic, adaptable, non-linear approach, on the other hand, enables entrepreneurs to “learn by doing,” and enables them to address these concepts as real challenges to the actual development of their enterprises.

A global, “network-centric” approach to the deployment of “just in time” resources will enable entrepreneurs to address the challenges and the opportunities they face as an unending set of converging and diverging streams. In so doing, they wrestle with the “rough and tumble” of the actual marketplace, sharpen their skills, and become far more agile and responsive than they otherwise would be.

*Mass customization learning by doing, and the need for a “many to many” training pedagogy*

Entrepreneurs come in all sizes, flavors and styles, as the saying goes. High growth entrepreneurs are no exception. While they share certain characteristics, they have diverse challenges that operate differently both in degree and as they apply to different individual situations. This reinforces the need for a “mass customized” program. Entrepreneur support organizations would need to suspend any curricular program and develop a new way to interact with high growth entrepreneurs, using dynamic interview tools in discussion sessions with the latter to develop a program (activities, people resources, time line expectations, etc.) that is customized to the entrepreneur, and moves in concert with his/her regular everyday work plan. They also agree on a set of activities which will incorporate the resolution of issues and concerns that the entrepreneur faces in his everyday work: the basis of “learning by doing,” a key concept in network-centric assistance.

Each approach to the commercial marketplace, each set of interactions needed will be sufficiently different – and nuanced – for individual entrepreneurs than is covered (or possible) in existing training programs, as we have discussed. The mass customization approach is more vital in the new global landscape, since high growth entrepreneurs must assess, acknowledge, and adopt different strategies (and tactics) for different purposes, in a continuous march to commercial value, revenue, relevance and position in the global marketplace.

In addition, a “many to many” training pedagogy, whereby different “teachers” (who may even be specific business-level contacts in the entrepreneur’s target market) will be part of a constantly-evolving pantheon of “trainers” providing valuable, practical, hands-on, strategic and tactical “instruction,” is also needed in a time of dispersed competence and talent. This is a key characteristic of the network-centric approach to entrepreneurial training. The entrepreneurial support organization is constantly enhancing its network of domain, functional and issue experts, drawn from across multiple geographies (expertise, not geography is the key determinant of their value). Together, in conjunction with network managers, they form the knowledge assets of the network. These experts, who form part of an informal network, are linked by interest in high growth entrepreneurs (and occasionally hired for a specific engagement) and may be drawn from industry, technical disciplines, functional areas (e.g. regulatory or valuation) or other domain areas (legal for e.g.). Through informal consultations or formal feedback sessions, they provide just in time assistance to (a) specific entrepreneur (s) on a range of items - market/technology, industry/competitive intelligence or issue guidance, key insights, practical tips, or connections to others within their own networks. Indeed, the use of “networks within networks” is a critical - and highly appropriate - practice in today’s networked business environment, and confers great advantages on the high growth entrepreneur.

In Figure 2, the graphic represents the motivations, the players, and the outcomes. On

the left, the first three boxes from the top (Nodes, Links and Common Goals) indicate the actors (individuals, organizations, etc.), the motivation and placement (linked by common interest and across boundaries) and the common qualities associated with “members” (knowledge and skill and expectation of reciprocity). The bottom box (Flexibility) indicates some additional characteristics of the networked organization used in the provision of assistance (just in time and also refers to the ability of members to rotate in and out of the network on a continuing basis).

*Online tools and platforms enable great flexibility in the management of innovation assets*

New online tools enable regions and entrepreneur support organizations to virtually nurture enterprises that can be scaled quickly and become globally aware and more relevant faster, starting with the inception of the enterprise.

Larta Institute designs and develops online project management systems (“portals”) for its commercialization assistance programs, geared toward the management of scores of enterprises’ interactions, customized marketplace strategies, and value propositions in widely dispersed geographical locations across the U.S. and across the globe. The people resources featured in these “portals” are selected without attention to place, their primary attractions being their domain and market knowledge, the robustness of their own networks, and the ability to quickly assess and determine the optimal interactions with the high growth entrepreneur with whom they will communicate and work. The principle underlying this “training” provided under Larta Institute’s CAPs and its Global Bridge™<sup>23</sup> programs is empowerment of high growth entrepreneurs; they build interlocking and mutually reinforcing networks of key contacts for specific strategies associated with market presence across the globe, while maintaining small, cohesive teams. It also builds in feedback from key constituents and customers worldwide in a virtual “loop” that focuses on adaptability and global presence.

The necessity for efficient management of innovation assets becomes clearer as we go back to the needs of the high growth entrepreneur; now considering another aspect of an entrepreneur’s resource pool: time. As Takuji Tsukamoto, the President and CSO of Chemica Technologies<sup>24</sup> (also a participant in a Larta CAP) points out, an entrepreneur that has a company to run often does not have the time to utilize or wrangle the resources or assets available in his region even if they do exist.

Furthermore, the ability to call upon (people) resources “just-in-time” is characterized by trust and familiarity. These relationships take time to foster and care for - something that cannot be done “just-in-time” when an entrepreneur needs support in adapting to a quickly changing market. Thus, there is great value to many entrepreneurs facing the

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<sup>23</sup> Larta commercialization assistance services supporting entrepreneurs outside of the United States are carried out under the Global Bridge trademark.

<sup>24</sup> Chemica Technologies develops novel sorbent/ligand technologies which are applied to water remediation, blood purification, and molecular imaging of tumors. The company was a participant in Larta’s 2005-2006 and 2010-2011 NIH Commercialization Assistance Programs.

same time constraint being supported by an organization that can effectively manage, bundle and offer up required resources to entrepreneurs “just-in-time.”

## Conclusion

The Chinese curse, “May you live in interesting times” (which, apparently, may not be Chinese after all!) does provide us with a compelling point at which to end our paper.

The environment for high growth entrepreneurs is more full of promise and potential than at perhaps any other time in the history of entrepreneurship. The world - ideas, products, people, markets - is more interconnected than ever before, and the speed at which innovations are created, crystallized and connected makes the challenge and the opportunity for high growth (high potential) entrepreneurs considerable. The conventional approach to nurturing and assisting entrepreneurs, focused on their growth in clustered environments, including incubators and science parks, is constraining for high growth entrepreneurs. While clusters and their ilk offer incentives focused on local growth and local success, high growth entrepreneurs may find themselves too sheltered and thus may not take certain crucial steps necessary to go beyond the local environment developed in a clustered environment. Finding and using people resources ‘just in time’, wherever they may be, uncovering market opportunities across conventional boundaries, making oneself visible to a range of possible partners and customers, and obtaining feedback to constantly refine and calibrate one’s offering/s - these are imperatives which call for an assistance program that is flexible, non-linear and networked - a “network-centric” model. Not only are these imperatives not served by the offerings of clustered operations, we maintain that they are incompatible with their mandates, motivations and incentives.

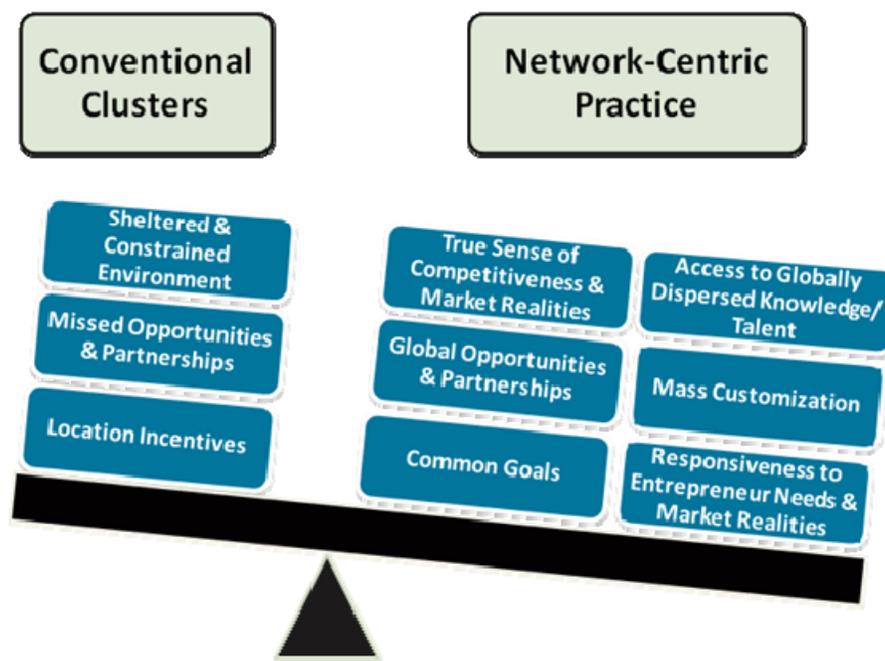


Figure 3: Weighing the options

However, these imperatives drive what is the most appropriate kind of assistance that today's high growth entrepreneur can (and will use). This new assistance paradigm, the network-centric approach to entrepreneurial assistance, also characterizes the work of networked organizations, whose managers are focused on the constant evolution and development of a network of people linked by interest in the offerings of high growth entrepreneurs and drawn from a range of experiences, sectors, backgrounds and capabilities. The interconnections and relationships that are formed between 'members' of this network are developed through a strong hub operation, and the structure, work flow and operating principles of the organization allow easy entry and exit from the network, in a never-ending process that matches the changing marketplace.

Martin Luther King may have captured the character of this enterprise best when he said, "All men are caught in an inescapable network of mutuality."

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## References

- Aldrich, Howard. 1999. *Organizations Evolving*. London: Sage Publications.
- Amezcuca, Alejandro S. 2010. "Boon or Boondoggle? Business Incubation as Entrepreneurship Policy." PhD diss., Syracuse University.
- Bhide, Amar. 2008. *The Venturesome Economy: How Innovation Sustains Prosperity in a More Connected World*. Princeton: Princeton University Press.
- Bogdan, Glăvan. 2008. "Coordination Failures, Cluster Theory and Entrepreneurship: A critical view." *Quarterly Journal of Austrian Economics* 11.1: 43 - 59. doi: [10.1007/s12113-008-9030-x](https://doi.org/10.1007/s12113-008-9030-x).
- Fitjar, Rune D., and Andrés Rodríguez-Pose. 2011. "When Local Interaction Does Not suffice: Sources of Firm Innovation in Urban Norway." Institute Imdea Social Sciences, Working papers series in Economics and Social Sciences 2011/05
- Kukalis, Sal. 2010. "Agglomeration Economies and Firm Performance: The Case of Industry Clusters." *Journal of Management* 36: 453-481.
- Porter, Michael E. 2000. "Location, Competition, and Economic Development: Local Clusters in a Global Economy." *Economic Development Quarterly* 14.1 :15-34.
- Saxenian, AnnaLee. 1994. *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*. Cambridge: Harvard University Press.
- Wadhwa, Vivek. 2010. "A Better Formula for Economic Growth: Connecting Smart Risk Takers." *The Chronicle of Higher Education*, November 18. <http://chronicle.com/article/A-Better-Formula-for-Economic/125441/>.