



INNOVATION BRIEF



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“ Four strategies to overcome human capital constraints:

- Leveraging talent and knowledge
- Re-purposing inventors
- Training for professional biculturalism
- Developing emergent strategies for emerging markets”

Silver Bullet: Learning to Manage Human Capital

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Executive Summary

New technology ventures face an innovation imperative. They must continue implementing new ideas in order to create value and grow. To keep the innovation imperative moving, human capital - in the form of the individuals employed by these firms - must be readily available. Defined as a worker's knowledge, skills and abilities, human capital has long been considered an important resource for technology firms.¹

While human capital may be valuable, it can also be costly and difficult to both acquire and retain. As sociologist Howard Aldrich writes, “[most firms] can't always get what they want, and certainly don't always get what they need.”² The issues of resource and time constraints are significantly exacerbated in emerging economies where human resource management and human capital development practices are still evolving. Due to resource and time constraints, many entrepreneurial firms use bricolage (“making do with what is on hand”)³. Bricolage is particularly important for new technology ventures, where the resource on hand is the technological skills of employees.⁴ Human asset evaluation – knowing what the firm has on hand – is the first step to employing human capital bricolage as a means to overcome human capital constraints.

Human Asset Evaluation

Unlike tangible assets (machines, building, land), human assets are difficult to manage because their value is hard to quantify. Any discussion of human capital implies that people within an organization represent more than just the value of their salaries. In addition to looking at an employee's salary, valuation must take into account the significance of replacing that employee.⁵ This concept is not novel to new technology ventures. Stronger financial performers understand the potential of their employees (Exhibit 1).

New innovations do not emanate from tools, technology or streamlined processes. They stem directly from human assets. Likewise, technical issues are not primarily responsible for failed innovations. Poor utilization of human assets characterizes most unsuccessful cases of firm innovation. Moreover, human assets, like tangible assets, can depreciate in value. Human assets

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can increase in value through enriched experience, enhanced education and regular investment. It is not enough for entrepreneurs to just understand the value of firm human assets. They must also develop strategies to enhance the worth of firm assets by making do with the human capital on hand.

Managing Human Capital in New Technology Ventures

Once a firm understands the potential of its employees and the value of its human assets, four specific strategies can help new technology ventures overcome human capital constraints by enhancing an existing human asset's worth – i.e. making do with the human resources on hand.

1. Leveraging talent and knowledge: While many new technology ventures talk of a human capital shortage and struggle to make headway in the talent race, some change trajectory by leveraging the talent already in place. For new technology ventures, this talent and resource is knowledge.

In today's economy, knowledge can be both an input and an output for many thriving firms. Knowledge, unlike generic resources, has special characteristics – namely that explicit

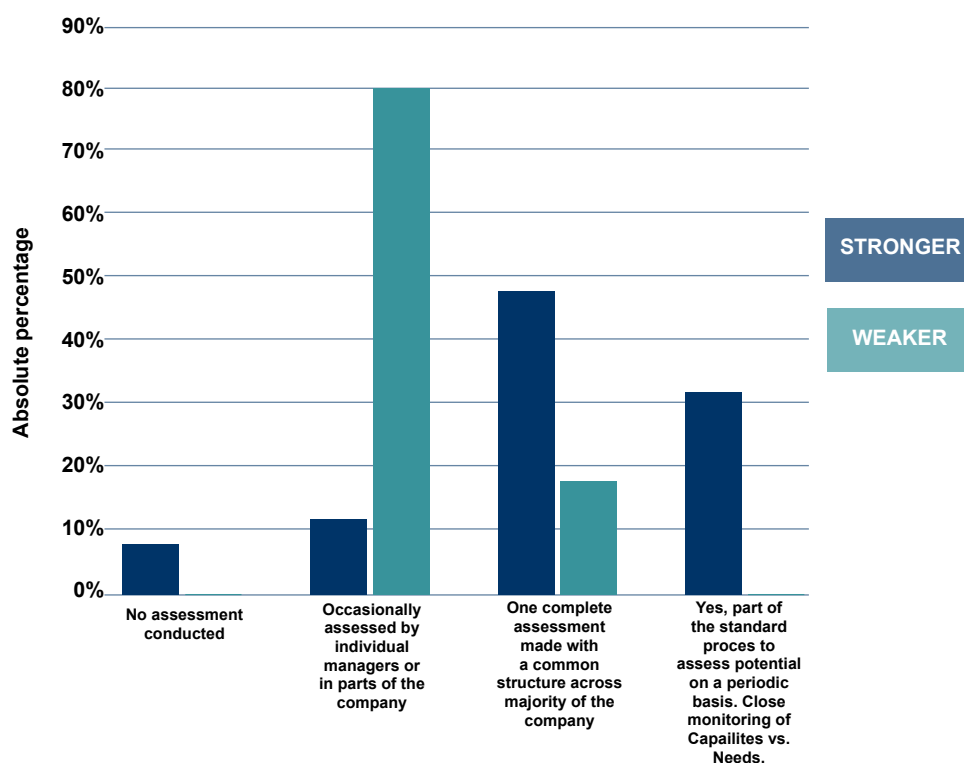
and implicit knowledge vary in their transferability and the capacity of the firm to accumulate and maintain them. Implicit knowledge rests inside the individual (a new idea for process innovation), while explicit knowledge can exist in tangible form away from its creator (a training manual).

Implicit and explicit knowledge can be leveraged in an entrepreneurial firm by transporting existing technology applications into new application domains, i.e. new product markets.⁶ Cross-application is highly relevant for new technology ventures facing human capital constraints.

The BHA Group (now a subsidiary of General Electric), for example, developed and manufactured venting membranes for use in industrial air pollution control devices. Their core technology focused on the production of flexible membranes with specific pore sizes, size distribution and thickness which could be laminated to fabric (e.g.

for filter bags). BHA inventors quickly realized that membranes which allow moisture to pass in only one direction could have many uses. The company developed eVent fabric that lets moisture escape from the body while remaining waterproof and licensed this fabric to manufacturers of skiwear, children's boots, sleeping bags and myriad products. In a perfect instance of cross-

Figure 1: Do You Currently Understand the Potential of Your Employees?



application, BHA used existing production technology to manufacture and laminate membranes with the correct pore size and weight for clothing applications (see www.eventfabrics.com and www.bha.com).

2. Re-purposing inventors: Simply put, knowledge is created by individuals. Therefore, firms must take stock of their human assets and the knowledge-base each person contributes to the technological capabilities of the firm. Individuals' sets of capabilities can be recombined through a reallocation of inventors (inventor bricolage). This process can be fostered by teaming inventors with more creative capacity (i.e., more broad past patenting experience) with co-inventors who have relevant experience.⁷

It is important to note that strong teams are essential for individuals to be effective. As innovation is a distributed process that continues to arise more frequently from team efforts, successful firms are those that can better integrate and apply specialized, individual knowledge.⁸

3. Training for professional biculturalism: Culture can be defined as a network of distributed knowledge (ideas, beliefs, practices and values) that is produced, shared and reproduced among a collection of interconnected individuals.⁹ A culture existing between R&D personnel, technologists, engineers and "hard" scientists can be referred to as the T-culture. A secondary culture, known as the S-culture, pertains to social "soft scientists" including business, sociology and psychology professionals.¹⁰ Each of these cultures has its own practitioners, languages, modes of analysis and standards of validation.

Adhering to a disciplinary culture is a double-edged sword. On the one hand, it provides a foundation to structural knowledge acquisition, organization and generation within a discipline. On the other hand, it creates intellectual blind spots for practitioners of each discipline. Professional biculturalism is the key to navigating domains where knowledge from seemingly dissimilar disciplines is required to solve problems. Training protocol can be developed to impart professional biculturalism techniques and to teach members from each of the S- and T- cultures to function effectively in both cultural contexts.

4. Developing emergent strategies for emerging markets: Emerging markets are those that fall short – to varying degrees – in providing institutions (capital markets, labor markets, product markets, government regulations and contract enforcement) for necessary, basic support of business operations.¹¹ It is difficult to utilize traditional strategies in such markets, as it is challenging to characterize the shifting environments in which firms are operating and to articulate the links between strategic choices, environments and firm performance.¹² In such circumstances, technology entrepreneurs must improvise and be prepared to take on unintended emergent strategies.¹³

Google, for example, develops emergent strategies for emerging markets by allowing the brightest employees to use 20 percent of their time to pursue projects of their own choosing (see <http://abcnews.go.com/Technology/story?id=4839327&page=1>). Some popular projects conceptualized and developed by Google engineers during their "20% time" include Orkut, Google News, Google Suggests and AdSense. While this practice has been the focus of much debate, the key to moving from a mountain of great ideas to a few terrific products is clear communication and try-storming (fail as early and often as possible).¹⁴

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“ Bricolage encourages potential entrepreneurs to make do with what is on hand.”

Leveraging, Repurposing, Training and Developing Human Assets: A Sustainable Strategy

The model of entrepreneurship most often taught in business schools and read about in the popular press involves coming up with a brilliant idea for current or future needs, pursuing the acquisition of the requisite resources to implement that idea, and seeing it to fruition. However, this model can discourage potential entrepreneurs who do not have “brilliant” ideas or see themselves as persuasive or aggressive enough to obtain the necessary resources.

An alternate method of entrepreneurship, bricolage, encourages potential entrepreneurs to make do with what is on hand. In this model, potential entrepreneurs assess their resources and recombine or reuse those resources to find the best possible solutions to current problems. This method is particularly useful to entrepreneurs in emerging markets where institutional voids prevent the easy acquisition of requisite resources.

Moreover, as Nobel laureate Herbert Simon identified, bounded rationality limits our ability to behave in optimizing or maximizing ways.¹⁵ Instead, one often needs to satisfice (satisfy + suffice) by identifying a solution that meets a minimal set of requirements. In fact, most entrepreneurs face substantial resource constraints during the creation and growth of their firm. Where the resource in question is knowledge embodied in individuals, entrepreneurs who can best generate, accumulate and apply implicit and explicit knowledge - especially under conditions that require satisficing behavior - will ultimately succeed.

Overcoming human capital constraints is critical for the survival of new technology ventures. The four strategies described here (leveraging talent and knowledge; repurposing inventors; training for professional biculturalism; and developing emergent strategies for emerging markets) are just a start. However, these strategies are a necessary way of making do with existing human assets. Human capital bricolage has been found to improve a firm's sustainability both economically, socially and environmentally.¹⁶

A global Gallup survey found that at the average big firm only 33% of employees describe themselves as fully engaged in their work, 49% say they are not engaged and 18% say they are “actively disengaged”. At what Gallup calls “world-class” companies, the proportions are 67%, 26% and 7% respectively.¹⁷ This has implications across the entire organization, requiring a general increase in technical skills across the board. If employees find their jobs too boring, they will soon become demotivated and leave, and finding replacements is time-consuming and costly. Companies are now doing their best to keep even those individuals doing routine jobs engaged in their work.

Human assets are similar to other physical assets in that they are depletable and their use has impacts on the environment and society. As a result, in order for firms to reach sustainability goals, they cannot ignore the role that human assets play in supporting sustainability. Repurposing and reallocating the existing base of human capital minimizes the disruptive efforts of employee turnover on the firm and society and reduces the need for firms to acquire and consume new resources. Improving impacts on employees is required for improving employee impacts on the workplace, marketplace, community and environment.¹⁸

Of course, there are several common challenges to developing and implementing human capital evaluation and enhancement processes. These include: a lack of consensual definitions and processes; complexity of process and of assigning valuations consistently and coherently; subjectivity in application; and misaligned information needs across a firm. If these development and implementation challenges can be reduced or eliminated through planning and aligning the valuation and assessment processes, new technology ventures can benefit from evaluating

and enhancing the worth of their existing human assets. While making do with the resources on hand is a sustainable strategy for technology entrepreneurship, it begins with a good pool of existing human assets. Not all capital is good capital, and this mantra applies to human capital, physical capital and financial capital.

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