Managing Human Capital as a Real Business Asset

An Introductory Discussion

Jeanne DiFrancesco

CEO and Chairman, ProOrbis LLC

Published IHRIM Journal. March 2002

Updated and Revised February 2021

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MANAGEMENT INNOVATIONS

As you peruse the avalanche of annual reports that will be released this year, how many will loudly and confidently proclaim, "people are our most valuable asset?" How many CEOs will make similar declarations at their annual shareholder's meeting? Although we would agree most CEOs are acutely aware of their investments in their "most valuable asset" (salaries, benefits, training, recruiting programs and the like), almost none could tell you what their "most valuable asset" is worth.

This issue has been examined and hotly debated for well over 40 years. The finance profession will tell us that people are not a business asset — they do not meet the criteria and they are impossible to "value." Although many (perhaps most) managers actually have the intuition that if they make an investment in their people, some value would be realized, most could not tell you how that value would be generated or how to calculate it.

This is the dilemma most companies face today. It has only been exacerbated by the trend away from financial and physical capital as sources of competitive advantage as the we move through the 4th to the 5th industrial revolution. Talented people, brilliant product designs, big data, network platforms, strong brands, customer relationships, and intellectual property have dominated the landscape and make the difference between success and failure in most modern businesses.

These types of assets are called *intangible* assets by the accounting profession. Intangibles are not generally captured on the balance sheet of an organization and investments in intangibles are generally considered "costs." So, when companies go through exercises of "cost reduction," which investments tend to go first?

So, is our "most valuable asset" an asset or not? If it is an asset, how would we calculate our investment, what would be its value, and how could we improve our return on investment (ROI)? In the end, is measuring just too hard or too pointless — should we just give up?

Defining our "Most Valuable Asset"

To define the characteristics of an asset, we look to the U.S. Financial Accounting Standards Board who defines an asset as something tangible or intangible obtained by an entity and exhibiting three characteristics:

- The asset embodies probable future benefits that will have an impact on cash inflows,
- The owner can obtain the benefit from the asset and control the access of others to it, and
- The event leading to the rights to control the benefit is in the past.

In other words, an asset is something the company controls the rights to use and it has productive capability to produce future returns.

In a business, *people* do not seem to meet these criteria. The company cannot control access to people. They can come and go, as they like. Therefore, are people not assets as the finance department has always said? Is the CEO's statement that "people are an asset" just an expression?

Strategic Frameworks and Analytics—A Perspective

This is not the first time this problem has been considered, as the world is only getting more complex not less. This is the reason physicists search for a unified field theory — not because they do not want to contemplate complexity, but rather because they do. The following is not an exhaustive dissertation on the intricacies of organizational dynamics, competencies, incentive plan designs or leadership styles. There is plenty written about these topics. This is a strategic framework for thinking about what human capital is and how it can be handled as a business asset both strategically and quantitatively.

This framework allows the more specialized work in the areas of human capital to be considered in the context of business value. The paradigm offered here is not intended to be simplistic, but rather to offer a clear path to think about the relationship between variables —a framework on which to hang more complex concepts.

Perhaps there are CEO's that do not care about returns on their investments (I have not met them, but that does not mean that they do not exist). There are authors that argue that business is just too complex and attempting to quantify any of this is just futile. They scoff at the notion that you can measure these things and find it quaint to even try. Others argue against

Is the CEO's statement that "people are our most valuable asset" an analytical fact or just an expression?

attempting to "account" for intangibles. People approach this topic with a variety of emotional and cultural perspectives ("you can't be serious — people cannot be valued").

The insight offered here requires that you suspend disbelief. Recognize that solving this dilemma will require a paradigm *shift* and it may require reconsidering what you think you know. Smart people have been thinking about this for decades and if the issue were solvable by the tools of any single discipline, it would have been solved already.

There is so much writing about this topic that defining terms and carefully constructing the relationships between variables is half the battle. By integrating concepts from economics, finance, operations research, strategy, and the human resource disciplines, we have created a new *theory of the firm*.

As with all theories, the test is, does it 1) describe what is happening, 2) explain why it is happening, and 3) predict what will happen next. (Figure 1). Financial accounting is also a "theory", but one that often fails to measure of human capital (and most intangibles) on all three criteria.

Figure 1

BUSINESS STRATEGY AND THE CREATION OF VALUE

To clarify our use of terms, we will begin with how a business creates value (see Figure 2). Every organization has ability to do certain things (like making cars, filling vending machines, designing computer chips, etc.); these are *Organizational Capabilities*. These capabilities are able to meet certain needs that buyers have for goods and or services, the buyer's *Market Needs*. The intersection of an organization's capabilities and the needs in the market is referred to as the *Market Space*. In order for an organization to make any money, it must actually offer goods and services into the market space: these are the *Offerings*. The offering is what the customer buys and includes everything from the product and services to the implied warranties of the brand. Market share is the percent of the market space that is populated by a company's offerings.

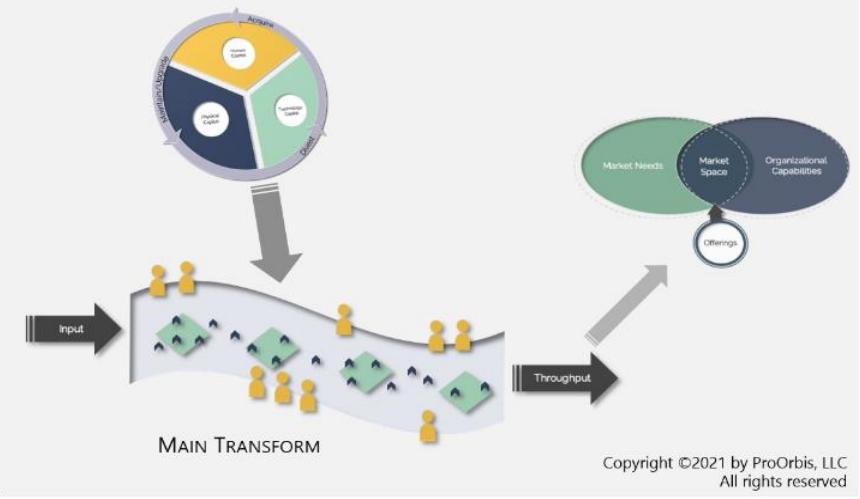
Figure 2. Business Strategy Development

Organizational capability is comprised of three classes of assets (see Figure 3) that are core to its ability to produce goods and services — P*hysical Capital (PC), Technology Capita (TC)l and Human Capital (HC)*. Physical capital is widely known and understood by financial accounting and includes plant and equipment, facilities, desks, chairs, etc. Technology capital includes both product technology (patent formulas, product designs, etc.) and process technology (the methods that delineates the steps in the process). Information technology tends to be a combination of some physical capital (computer hardware, printers, etc.) and some application technology (software, procedures, standards, etc.).

So, what is human capital? The human capital of an organization is not people. People own their human capital and invest it in many different aspects of their lives: family, community interests, hobbies or sports and work. *Therefore, a company's human capital asset, is the sum of the talent, energy, knowledge, and enthusiasm that people invest in their work.*

In financial accounting, physical capital is generally the only class of core asset to be considered *tangible*. Human capital (as well as most of technology capital) are generally considered to be *intangible*. Of course, there is more to organizational capability than just the core assets — there are brands, channels, customer relationships, intellectual capital, knowledge management, networks, and the like. We will revisit the treatment of these after we consider how core assets create value.

Figure 3. Core Assets are Configured to Create Business Process Designs.



BUSINESS OPERATIONS DESIGN

Process technology takes human capital, physical capital and product technology and configures them into business process designs (see Figure 3). Think of any business process you can imagine, and you will find it is comprised of these core asset classes. The business processes configured by the company's core assets requires something to process. *Inputs* are factors such as raw materials, energy, subassembly, or subcontracted services. Inputs are not a part of the productive capability of the organization — they cannot produce anything — they are used up in the process.

These business processes are the *Capabilities* of the enterprise and they are configured to produce something that has value — the *Offering*. The offering is produced through myriad business processes (production, marketing, distribution, and so on) the output of which has value -- something a customer will pay for now or in the future. This valuable output we term *Throughput* to distinguish it from output that does not have value (such as obsolete inventory or management reports that no one reads). We term the processes involved in producing the offering as the M*ain Transform*.

Inputs are generally another organization's throughput. If you think about it, the outsourcing decision is usually one of simply redrawing the boundaries of the organization. This typically leads to a reduction in the assets a company holds, but an increase in the cost of inputs.

As you can see, expenses fall in to four principal categories — inputs, human capital, physical capital, or technology capital – there is nothing else.

VALUING ASSETS

Using this strategic framework and properly structured data, the value of all assets can be calculated. Recall that organizational assets are not purchased to be resold directly. They are purchased to become part of the productive capability of an enterprise. In this way they "derive" their value from the offering (the thing the company does intend to sell). Therefore, the value of an asset depends on how it contributes to the value the firm creates in the *Main Transform* by converting *Inputs* to *Throughputs*.

If assets create the business process and the business process transforms inputs into throughputs, then it follows that the value of the assets is the difference between the cost of the inputs and the value of the throughputs. This is the value the assets created. Therefore:

Throughput - Input =
Value of the Core Assets

This form of valuation assumes there is a going business concern. This is different from the value placed on assets when a firm is to be shut down. Liquidated assets are only worth what you can sell them for, not what you can make with them. It is also true that core assets in a going concern only have value in *combination*. To gain intuitive insight on this concept, try thinking of any business process in your firm and imagine taking any one asset completely out of it. What is the value of the throughput? Generally, zero. It is especially problematic to think about the value of intangible assets outside the context of their working with other assets. Because one asset can often be used in place of another (i.e., more computers, less people), there is a concept of the best possible combination we refer to as the optimized asset mix.

*Using this strategic framework and properly structured data, the **value** of all assets, both tangible and intangible, **can** be calculated.*

OTHER INTANGIBLE ASSETS

As mentioned previously, there are other intangible assets that are not core assets such as brands, channels, big data, networks, platforms customer relationships, and the like. These assets are created by the core assets using business processes and are "reused" in future periods. The best example to think of is simple brand valuation. A brand is not created all at once, but rather is the accumulation of significant effort over long periods. Some of brand management is done with a company's "internal" resources such as marketing staff, their computers, their offices (core assets) and this team may purchase market research and hire an ad agency (inputs) as part of the process of creating the brand. A product with a helpful brand can sell more and at higher prices than the same product unbranded (causing throughput to go up). However, the brand is not used up — rather it is used repeatedly in multiple periods. It behaves more like an asset. Most classes of what is generally termed intangible assets that are not considered core assets have this characteristic.

The other type of "asset" which is often referenced is knowledge capital. This type of resource is a little different in that it is not an asset at all. Knowledge (in and of itself) does not have productive capabilities. Knowledge becomes productive when it is embedded in a core asset (if someone can read it and use it in their work, or the knowledge improves a product design, etc.). Most of what is termed intellectual capital (if it is not knowledge) falls into the product or process technology arenas (like patents, trademarks, contract templates, etc.).

RETURN ON INVESTMENTS

Once we know both the value and the investment in the core assets, it is now possible to do a return on investment (ROI) calculation. This is the ratio of the value of the assets (throughput minus inputs) to investments in the assets. Therefore:

$$\frac{\text{Throughput-Input}}{\text{Investments in the Core Assets}} = \text{Return on Investment}$$

This concept of ROI is also the intuitive concept of Productivity. Most managers, when they say they want to improve human productivity, mean that they would like to improve the relationship between the value and the investment.

Investments made in the company's assets may pay off over a long period. Therefore, when we talk about return on investments in assets, we need to try to match the investment with the period in which the value is generated. This concept of periodicity is clearly recognized in the way traditional accounting methods treat investment in physical assets. The practice known as depreciation allows such investments to be expensed over the useful life of the asset.

However, since traditional financial accounting does not treat intangibles (as we have broadly defined them here) as assets; all investments in intangibles are expensed immediately, creating a mismatch between investment and the return in any short-term period (e.g., one year). By failing to recognize the long-lived nature of intangible assets, longer-term investments in intangible assets are generally discouraged using financial accounting techniques.

HUMAN CAPITAL — THE ASSET REVISITED

Hence the resolution of the first dilemma — *people* are not the asset of a company — but human capital is. In the context of the criteria for an asset, this definition of human capital meets the FASB requirements as:

- A company makes an employment arrangement with an employee (The event leading to the rights to control the benefit is in the past);
- Generally, the employee's activity is in control of the company while they are "on the job." (The owner can obtain the benefit from the asset and control the access of others to it); and
- The employees' activities are part of the production function that will create the cash flows of the future. (The asset embodies probable future benefits that will have an impact on cash inflows.)

The truth is that any manager can reduce costs; improving return on investment is the real challenge.

It is true that some employees are more "asset-like" than others. The more stable the relationship, the more the company invests in the employee with the expectation that they will stay with the firm, the more "asset-like" the employee is.

It is hard to say how different organizations would be if they managed their human capital investments with the same consciousness as their physical

capital investments. Arguably it would be a far different decision-making process when earnings did not meet expectations. Can you imagine the reaction of the Wall Street analysts if a company said it was going to cut costs by shutting down one of 10 plants? Imagine if they said they were going to "pay" to get rid of the plant? Can you see the stock price soaring? Now, think of the typical 10 percent labor force layoff with a generous severance or early retirement package. How attractive is that to the company's stock valuation?

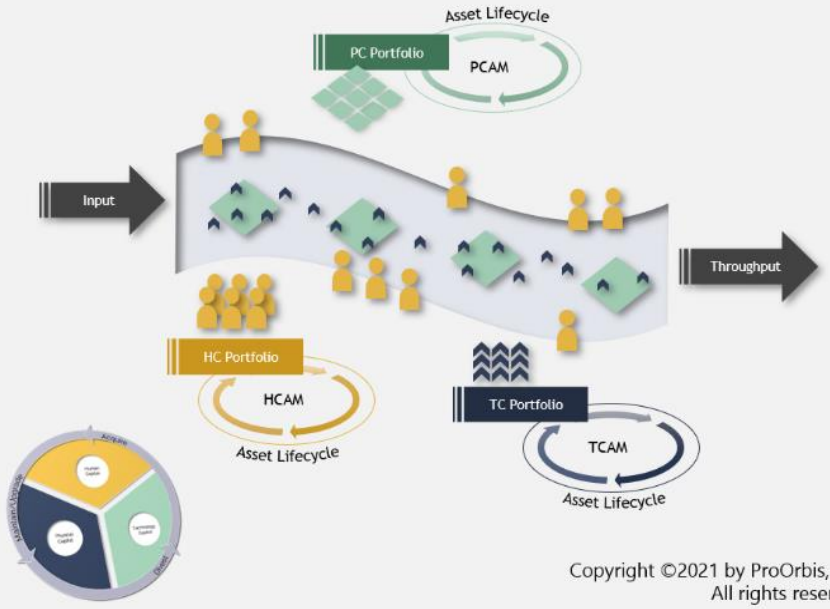
I can recall an encounter with a senior manager whose spending on human capital was about $7 billion a year. He approached me with some anxiety and distress looking for ways to reduce the cost of this budget. Salary policy was well within this senior manager's control. I thought for a moment and replied, "We could reduce the cost of payroll by 10 percent before lunch, but what would we do the rest of the day?" The truth is any manager can reduce costs. Reducing costs while maintaining value (improving productivity) is the is the challenge.

Investments In Assets

The core assets of the firm do not magically materialize, of course. Assets must be acquired, operated and, perhaps at some point, divested to keep the business processes optimized. We refer to this process as *Lifecycle Asset Management* (See Figure 4). Each core asset requires lifecycle asset management (acquisition, maintenance, upgrade, and divestiture).

In a manufacturing firm, physical capital generally has legions of engineers, maintenance, and construction services to ensure that

Figure 4. Asset Management.



the physical capital contemplated by the operations design shows up doing what it was intended to do. Often, technology is supported by large research and development (R&D) organizations whose sole responsibility is to invent the formula, design, etc., to make the offerings come into being. So, what about human capital investments? The investment in the asset includes all the costs of managing the asset. For human capital, this would include everything from compensation and benefits to training and development, recruiting, selection, performance management and the administration of the human capital asset, e.g., the HR information system, benefit administration, and the cost of the HR staff.

Companies also invest time in managing human capital assets — time, not just of HR staff, but of managers and employees involved in HR management processes such as pay administration, performance evaluation, hiring, etc. If the cost of this time were added to out-of-pocket expenses, many organizations would find their investments in human capital are significantly higher than they ever imagined.

Human Capital Asset Management

What does it take to manage human capital (HC) as a business asset? For the most part the cost of "HR stuff" (recruiting, training etc.) is recognized as part of the cost of HC, but rarely is it recognized that there is a process for managing human capital. To review, human capital has derivative value. The source of the value is the work that people do in the Main Transform. This work has value because the offering has value. The term for this is keeping *the bead* on the value and is critically important for establishing value

propositions for investments in assets.

So how do you get people to show up and do the work that was imagined in the business process design? How do you keep large groups coordinated? How does each individual player know what to do? How would you know if what they did was any good? This is the business of *asset management*. Asset management is also a business process. It is comprised of assets; it has a throughput and inputs.

One of the requirements of a process is that it is *integrated*. This is another term that is used often, but with different meanings. For our purposes, integration is when the output of one step is the input of another. It is the concept of being causally linked. This is different than the concept of *alignment*. Alignment is typically used to describe things that are consistent. Items can run in parallel and be aligned and never integrated.

The system that manages the human capital assets is of Human Capital Asset Management (HCAM®) and is depicted in Figure 5. The Throughput of HCAM® is the *portfolio of human capital* required to execute and manage the activities in the Main Transform.

It is a closed loop process — not a series of disconnected boxes. There are three distinct parts of the system that integrate in a specific pattern. The complexities of (HCAM®) are substantial, but only the basic understanding is needed to facilitate the value of investments in human capital.

The first part of the system we call *Performance Management.* This process starts with the work that human capital should do as designed

Figure 5. The Human Capital Asset Management System.

into the main transform. Once you know what people are intended to do (where they will be doing it, with what resources, etc.), you can then organize them. *Organization* structures can only create value in 3 ways 1) the management of work activity, 2) management of resources and 3) management of communications.

Organization structure adds more required activity which all must be bundled into **Roles** which include both performance expectations and specifications for people who will likely be able to perform the work. These skill requirements are typically structured into two principal categories: domain and enabling competencies. Domain competencies are typically job knowledge oriented (like engineering, accounting etc.) while enabling competencies tend to be factors such as communication or teaming skills. As we move through the 4th industrial revolution, the speed of information obsolescence has been eroding job knowledge in favor of a new class of competencies that underpin what we refer to as aptitude or speed of learning related skills.

Once the requirements for a role have been established, *Staffing* is where the human capital owner "enters" the system. The staffing process matches people to the role. Roles can be filled with an array of engagement arrangements, from full-time employment to temporary or contract staff. A role is the typical "unit" of HC.

Evaluation is a gap analysis that determines the difference between the requirements for the role and the performance of the person in the role. *Development* the fills the gap in performance.

At the end of the process, you have more "productive" human capital than when you started and in this way the Performance Management System "manufactures" human capability. Notice how the output of one step is the input of the next. This keeps all the activities linked to the

thing that has value (the work people do in the business process). The performance management system alone represents an enormous investment in HR staff, HRIS systems, management time, etc. We call these types of expenses *HCAM® Operating Expenses*.

Rewards is what you give to the owners of human capital in exchange for "showing up" and doing is required for their role. The problem with most concepts of rewards is that employers think of this as compensation and benefits. The reality is that employees consider compensation, benefits and a variety of other factors (such as "Do I like my job? How far is my commute? Can I work remotely? Do I have flexible work schedules? Do I have career opportunity? Is the company investing in my development? Do I like my boss etc?.") We call this array of factors Work Environment and consider it as part of the rewards mix.

Each aspect of rewards comprises a kind of "pie" that people weigh against the investment they make in their work (the individual's human capital investment). The employee considers the "trade" of the total rewards for performance the company requires and determine if in the net, "Is it worth working here."

All rewards can entail some form of investment. The rewards expense that goes directly to the employee we term *HC Direct Transfers*. The rewards expense for compensation administration, payroll service, etc. are *HCAM® Operating Expenses*.

The last, but not least aspect of the system is *Culture and Leadership*. These are the affective aspects of performance management. These are the parts of the system that appeal to and touch human emotion and effect motivation, will and commitment.

We use the term leadership to refer to the force that focuses and inspires people to invest more of their human capital. Leadership can come from any level of the organization and can propel people to where the company would like them to go — or someplace else. Culture is more like a milieu. It is what people fundamentally believe about working at the company and it is the filter through which they hear all communication. If people in your organization fundamentally believe that it is not "what you know but who you know," that will be the filter and your communications about "high performing people being selected for the top assignments" will not be believed nor create the desired effect.

To execute a particular strategy, there may be attitudes or perceptions that are essential to delivering the company's overall value proposition. A major chemical company that makes hazardous materials will need safety as a *Cultural Imperative*. Leaders are the stewards of the culture. Both leadership and culture can be managed, but again, this takes investment.

Within each aspect of the three layers if the system there are very tight linkages. We call this *strong form integration*. Between the layers there are also linkages, but they are more diffuse. A single cultural imperative may have influence on 1) organization design, 2) performance expectations in roles, 3) screening criteria in staffing, 4) development objectives, 5) incentive plan design, etc. We call this more diffuse pattern of linkage *weak form integration*.

HCAM® Integration and Predictive Analytics

By connecting the entire HCAM® system to the thing that has value (the work people do in the main transform), we put all aspects of activity traditionally thought of as HR stuff into a kind of supply chain, in which there are causal relationships between the elements.

Once the HCAM® system is integrated, the world of operations research techniques can be applied to HR plans and programs instead of relying on the inferential techniques of statistics to give you correlations. You can determine issues such as, where the bottleneck is and what kind of investment it takes to release it. Integrated systems give you the ability to "keep the bead" on value. This makes it possible to not only explain what is happening, but to predict what would happen with a particular kind of investment. The system efficiencies created when global supply chains were integrated during the past 20 years has been astounding. Imagine how much wasted effort there is in a disintegrated system that does not know what "valuable thing" it is making. How much of your HR and HRIT functions efforts are really "pointed" to value?

Although much of the investment in human capital, like wages and benefits, is "used up," there is some that is not. Training, development, teambuilding, performance appraisal systems, and recruiting programs often are not used up right away. These are investments in HCAM® "capabilities" that are created with combination of assets

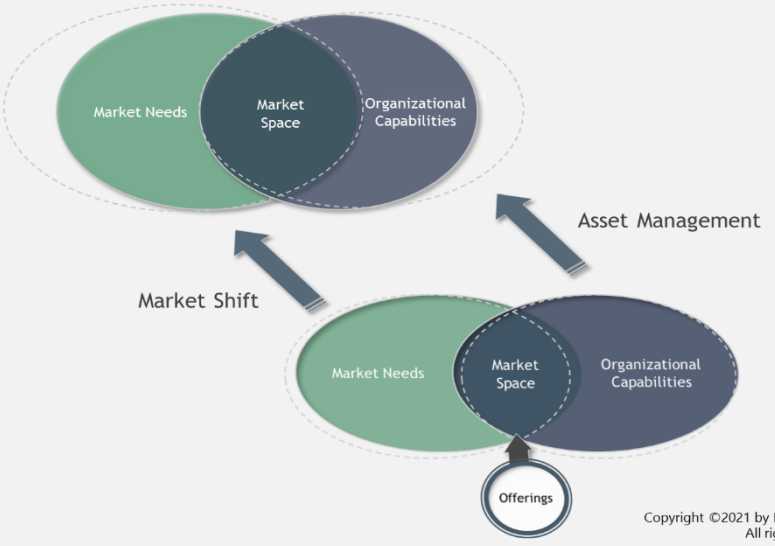
that also have varying useful lives. Therefore, as you consider return on any investment in human capital asset management, the question is, what value will it generate, and for how long?

How does the investment in human capital generate value again? Go back to the concept of throughput. Assuming everything else stays the same for a moment, the only way an additional dollar invested in human capital can generate a higher return is if throughput goes up more than one dollar. Therefore, to understand improving productivity, you must understand the relationship between the work people do and the value of the throughput.

Can people make a difference? Every business process can "tolerate" (i.e., use or accept) a certain range of performance for all the assets. If the performance falls below the range, it is said to be "unsatisfactory;" if it is better than what the system can use, it just goes to waste. Understanding *how* human performance affects the performance of the business process in creating the throughput, *Analysis of Performance*, is essential to doing human capital value propositions. Ask yourself this question, "If everyone in my company performed at the highest level according to my performance appraisal system, would throughput go up? Would it go up enough to cover the investment?" Most companies have yet to identify the human performance that would really change the throughput of the company

Often you will not have all the data needed to complete a perfect quantitative equation. Should this stop you? Perfect data does not exist now, yet decisions are made every day. Even being able to construct the value proposition in "words" can be tremendously helpful in clarifying the issues and identifying the likely "right answer." By introducing this discipline, you can begin to use *estimates and proxy* data while your organization works to accumulate the right data sets.

Figure 6. Asset Management Role in Capability Reconfiguration



Asset management can be a powerful competitive advantage or the organization's "Achilles heel."

HUMAN CAPITAL STRATEGY — AGILITY FOR THE FUTURE

Asset management systems must have the capability to reconfigure assets as the company shifts it capabilities to meet the market needs of the future. Capabilities require reconfiguration and new production functions (Main Transform) will require different activities, thereby setting new requirements for human capital. The plans for moving from one portfolio of human capital to another over time is the *Human Capital Strategy*. Strategies must also consider the changing population of workers as they age and enter the workforce. What is critical is that the right portfolio of human capital appear at the right time to deliver the offerings of the future.

Asset management capabilities can be a powerful competitive advantage or the organization's "Achilles heel." As markets shift, market spaces can evaporate — especially if the organization's capabilities are too slow to shift (see Figure 6).

However, responsive asset management can be "investment intensive" (read: expensive). So just how fast do you need to be? The question is, "How fast do your markets move?" Speed is a relative concept. To deal with market change, there are two knobs to turn — market foresight or fast changing assets. With market foresight and asset changing speed, asset managers can reposition a company's capabilities to sit more squarely on the market needs of the future, giving managers more "room to play" in formulating offerings. However, all speed will not necessarily show a positive ROI;

balancing speed and foresight in the value equation can be engineered to optimize ROI.

Some organizations, by taking all the "slack" out of their systems, often forget that change takes capability. Asset management capabilities are also created with assets.

When you introduce time into this model, scenarios for the future must be imagined. You can create an organization that executes today yet is paralyzed in its ability to respond to the future. In financial accounting terms, this organization will look spectacular but using ProOrbis analytics, the future can look very bleak.

Solving this age-old dilemma will require a willingness to shift the current paradigm and build value propositions that are strategically coherent and quantifiable.

Is Your Current Return On Investment Good Or Bad?

Once you have constructed your return statistics, the next natural question will be "Are my returns any good?" This is a question with several different answers depending on what definition of *good* you use.

Let us begin with the way to interpret a return statistic as we have constructed here. If the return ratio is 2.3, the interpretation would be — for every dollar we invest in assets, we get 2.3 dollars back.

The first test of a return statistic is, "Is it greater than one?" Assuming all the data has been properly periodicity matched and discounted, a return statistic of one or higher would be acceptable (hurdle the required return rate). Assuming the rate was hurdled, the second question you might ask is, "How are my business units performing compared to each other?" Interesting, but a tough comparison if business unit managers are facing different market conditions, opportunities, competitive dynamics, raw materials prices, etc.

Therefore, a third question you might ask is, "How the business is doing this year compared to last year?" This poses many issues of adjusting for economic conditions, changes in raw material prices, etc., over time and these issues could account for an improvement or decline.

To address some of these questions is the fourth question: How well did we do against the competition. This is a wonderful question in that it "washes out" a lot of market condition variables (everyone faced the same market) IF the companies are in the same industry. Isolating the input variable allows more valid comparisons between companies that approach the market with very different production functions (highly virtual versus vertically integrated). It is also a particularly good measure for evaluating executive management. After all, much of their job is positioning "their team's assets" against the competitors; determining how well those assets were positioned and managed for return would be reflected.

For those of you with large, diversified firms to manage, industry comparisons can also be used to index diverse businesses so they can be compared to each other. By producing a ratio of each business's return statistic with the industry statistic, you will see who is above and who is below the industry return and by how much. These "normalized" returns can then be used to compare one business unit to another.

Notice I did not ask, "How did we do against the goal?" Think about the goalsetting process in your organization. How many times have goals been achieved and firms lagged their industry groups and/or their opportunities? Goal setting is a topic unto itself but asking where your company's goals come from and what they have to do with the value of your company should be an interesting place to start.

Conclusion

Human capital is a real business asset, and for most companies, it is their most valuable asset. However, human capital is not handled like a real asset by financial accounting or most decision support analytics. Solving this age-old dilemma will require a willingness to shift the current paradigm and build value propositions that are strategically coherent and quantifiable. The numbers must both tell the strategic story and inform strategies.

The impact that these techniques can have on a company can be extraordinary. The strategic paradigms and advanced analytic tools discussed here can give managers in the 4th industrial revolution economy, the capability to manage fantastically complex and distributed workforces with human capital asset management systems that can meet the challenge.

When companies have a measure of the *value* of human capital, they know what they are *willing to invest*.

This has been elusive in a financial accounting driven system that does not recognize human capital (or any of the other intangible assets).

When companies understand where to invest in human capital to get the best returns, both the pool of investment available and employee productivity can increase. The specific skills needed, domain, enabling and aptitude-oriented competencies can be conveyed clearly and transparently to the "owners" of human capital and can be used by training institutions to create development programs that result in more valuable human capital.

Rewards can then be optimized resulting in both more satisfied and more productive workers which strengthens the overall economy. Think of how much human capital is wasted today. Think of what it would mean for that human capital to be devoted to a truly valuable use. The potential to make a difference for the individual, companies, industries and the economy are well worth the effort to manage human capital as a real asset.

ADDITIONAL RESOURCES

U.S. Bureau of Labor Statistics.

Davenport, T.O. (1999). Human Capital: What It Is and Why People Invest It. San Francisco: Jossey-Bass Publishers.

Drucker, P.F. (1999, Winter). "Knowledge worker productivity: The biggest challenge." California Management Review, 41(2).

DiFrancesco, J.M. & Berman, S.J. (2000, Summer). "Human Productivity: The New American Frontier." National Productivity Review.

"Extended mass layoffs in 1999 decline in third quarter from last year, BLS says." (1999, December 9). Daily Labor Report.

Gilbert, T.F. (1978). Human competence: Engineering worthy performance. New York: McGraw-Hill Book Co.

Goldratt, E.M. (1992). The Goal: a process of ongoing improvement. Great Barrington: North River Press, Inc.

Greene, B. (1999). The Elegant Universe. New York: Vintage Books, Random House Inc.

Johnson, T.H., and Kaplan, R.S. (1991). Relevance Lost: The Rise and Fall of Management Accounting. Boston: Harvard Business School Press.

Kaplan, R.S., Norton, D.P. (1996, January-February). "Using the balanced scorecard as a strategic management system." Harvard Business Review.

Kelly, J. (1999, March 11). "Changing our values." Financial Times of London.

Osterland, A. (2001, April). "Decoding Intangibles." CFO.

Stewart, Tom. (1998). Intellectual Capital: The New Wealth of Organizations. Doubleday and Company Incorporated.

Sungsup Ra, Unika Shrestha, Sameer Khatiwada, Seung Won Yoon & Kibum Kwon (2019) The rise of technology and impact on skills, International Journal of Training Research, 17:sup1, 26-40, DOI: 10.1080/14480220.2019.1629727

Webber, A.M. (2000, January-February). "New math for a new economy." (Baruch Lev in an interview with Alan M. Webber.) Fast Company.

Jeanne DiFrancesco is the Chief Executive Officer of ProOrbis, LLC, a consulting firm specializing in the development and application of advanced management concepts. She currently acts as an executive advisor to a wide range of enterprises in power generation and alternative energy, autonomous operations, electronic materials, aerospace, and commercialization of Lower Earth Orbis (LEO), banking and financial services, global business services, life-sciences, and national defense. Ms. DiFrancesco is one of the world's leading experts in the economic valuation of intangibles including assets such as human capital, brands, technology, intellectual property as well as mission valuation for both government and non-profit sectors. With over 30 years of executive and strategic level experience, Ms. DiFrancesco has architected projects from technology start-ups to some of the world's largest and most complex organizations. She is the author of the Reference Model for the International Space Station National Laboratory.

She authored the ProOrbis® Method, a breakthrough integrated framework of strategic and economic techniques that is used as a fully integrated paradigm for maximizing ROI in organizations and an interoperable data standard for multi-party platforms. For more information visit www.ProOrbis.com.

Jeanne is the founder of the American Millennium Society and serves as the Executive Director and Board Member. She is a highly sought-after speaker and has served as a subject matter expert for various groups, including Harvard University, the National Space Society (NSS), The Bankers Association for Finance and Trade (BAFT, part of the ABA), The Conference Board, the Institute of Human Resource Information Management (IHRIM), the Wall Street Summit, the Brookings Institution, Drexel University, and as a long-time guest lecturer at the Wharton School.

Prior to starting ProOrbis in 1998, Ms. DiFrancesco served as a Principal Consultant at Price Waterhouse and as an executive at DuPont. She holds an interdisciplinary undergraduate degree from the College of William and Mary and an MBA from the University of Pennsylvania's Wharton School of Business.