Intangibles at a Crossroads

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The extensive work on intangible (intellectual) assets performed in the 1990s succeeded in creating wide awareness of the vast magnitude and substantial impact of intangibles, and the serious harms from the information deficiencies related to these assets. Prof. Baruch Lev — an internationally recognized expert on intangible assets characterizes this awareness-creation as Phase I of the "Intangibles Movement." This movement is currently at a crossroads, raising the question of what’s next? Lev addresses this question, offering first a new perspective on the attributes of intangible assets, followed by a proposed shift of focus for the future work on intangibles.

1. Phase I: Documentation and Awareness Creation

The pioneers of the intangibles movement strove in the 1990s to alert managers, investors, and policymakers to the dramatic shift in the production functions and asset compositions of business enterprises the fast-increasing role of intangibles, becoming the primary drivers of corporate value and growth. This awareness creation effort was initially based on conceptual developments in the macroeconomic theory of growth ("endogenous growth models"), and subsequently on the empirical process of documenting the magnitude and impact of intangibles. Research, for example, indicated that in the late 1990s the annual U.S. investment in intangible assets (R&D, business processes and software, brand enhancement, employee training, etc.) was roughly $1.0 trillion, almost equal to the total investment of the manufacturing sector in physical assets ($1.1 trillion). Furthermore, intangible capital currently constitutes between one-half and two-thirds of corporate market value, of both “old-“ and “new-economy” enterprises (see Lev, 2001).

At the dawn of the 21st century, the prominence of intangibles as value and growth creators, at both the corporate and national economy levels, is widely accepted. Furthermore, there is general agreement that traditional (accounting-based) information systems fail to provide adequate numerical underpinning of intangibles and their economic impact. Research indicates that these “information failures” cause serious private and social harms, such as excessive cost of capital to intangibles-intensive enterprises, hindering their investment and growth; abnormally high volatility of stock prices, causing undue losses to investors and misallocation of resources in capital markets; systematic biases in managerial decisions; and excessive insider trading gains to corporate executives, eroding investors’ confidence (see Lev, 2001).

While there is reasonable agreement about the causes and consequences of the intangibles-related information deficiencies, there is a heated controversy about the necessary remedies, ranging all the way from doing nothing (let free market forces work their way to improve the situation), to a significant overhaul of corporate accounting and financial reporting practices. In between, are various proposals for encouraging voluntary corporate disclosure of intangibles-related information.

Thus, the “intangibles movement” has largely succeeded in the first phase of its mission: Creating wide awareness
and active discourse about the economic role of intangible assets and their consequences. This effort, however, appears now to face a crossroads.

What should follow the awareness-creation phase? Some hoped that by observing how firms manage intangibles and report internally about their values, we would be able to develop “best practice” cases for managers and design reporting modes for information disclosure about intangibles. Others believed that we could develop optimal valuation and disclosure practices for these assets by surveying the valuation practices of financial analysts and fund managers. My reading of the numerous surveys and questionnaire studies in this area leads me to conclude that, with but few exceptions, the persons being asked both managers and investors are at a very early stage of grappling with the management, valuation, and reporting of intangibles. To be sure, some companies report internally, and sometimes even externally, on certain aspects of intangible assets (e.g., employee and customer satisfaction), but such haphazard, non-standardized reporting is of little value for resource allocation or investment decisions. It is therefore questionable whether significant advances in the work on intangibles can be based on such observational studies.

Another route of investigation involved empirical research on intangibles, which provided significant contributions to the understanding of the causes and consequences of intangible investments. But this effort too, in my opinion, reached the stage of diminishing marginal returns, due primarily to the paucity of raw material for research: public information on intangible assets. Research and development in the United States is the only intangible investment required to be publicly reported by companies, and while we learned a lot from R&D (and related, e.g., patent-based) research, R&D is just one component of intangibles. There are no comprehensive data on brands, information technologies (IT) investment, employee training, business processes, and other important intangibles to support empirical research on measurement and valuation. So, where do we go next?

And go we must, because the available knowledge about intangibles is insufficient to address fundamental concerns of managers and investors, as the following examples demonstrate.

2. The Limits of the Current Intangibles Knowledge Base

I will use two current (early 2002) controversies to demonstrate the need for refocusing the investigative efforts in the intangibles area. The first concerns the proposed (approved in May 2002) merger between Hewlett-Packard (H-P) and Compaq, pitting major shareholders against their CEOs. The CEOs, promoting the virtues of the merger, claim that the new organization will cut costs substantially, streamline products, and become a major player in the highly profitable tech services sector. Antagonists, led by the Hewlett and Packard heirs, counter that practically all past big mergers between technology companies (e.g., AT&T and NCR in 1991) failed dismally, that H-P and Compaq lack a cadre of business service professionals poised to develop a meaningful services business, and that the merger’s raison d’être is flawed, since PCs, a major product of both companies, are essentially commodities with razor thin profit margins, unlikely to create much value.

This controversy seems ripe for experts on intangibles to analyze and resolve. The two companies are intangibles-intensive; in fact most of their assets are intangible: valuable patents, widely recognized brands, and highly qualified employees. Alas, the two sides to the controversy hired investment bankers to make their case to shareholders, rather than experts on intangibles (e.g., intangibles valuation consultants). Did they hire the wrong people? I am not sure. I must confess that I am hard-pressed to see what the accumulated work on intangible (intellectual) capital could have contributed to the H-P/Compaq merger and similar ones.

At issue are fundamental questions of corporate structure and performance: Why did H-P and Compaq, with all their valuable intangibles and knowledge management systems, lose market share consistently in recent years, and why have they seen their growth stagnate? Why did the innovation processes of these organizations erstwhile innovation leaders atrophy? Is a merger between two giants better suited to jump-start the companies than small, targeted acquisitions coupled with organic growth? Sadly, in my opinion, the concepts and tools developed to date in the intangibles field are not ready for “prime time” in several respects: for resolving fundamental issues of corporate structure and performance; or for addressing questions of innovation going awry, loss of competitive edge, or how to rejuvenate intangibles’ value.

The second case I consider, is, of course, Enron: a company that was hailed by “new economy” gurus and other pundit-apologists as the epitomization of value creation by intangibles energy and broadband markets, patents and brands, and advanced knowledge management systems. All those intangibles, valued not long ago at $60 billion by investors, vanished into thin air. Abstracting from the thorny issues of alleged fraudulent reporting to investors, careless auditing, and insiders’ self-dealing, one should still ask, “what happened to the intangibles?” Were our tools for intangibles valuation or knowledge management capable of predicting the implosion of Enron? Are we able to predict now who will be the next “Enron”? Is the accumulated knowledge about intangibles sufficient to provide policymakers with guidelines to prevent future massive losses of intangibles?

This is what I mean by “intangibles efforts at a crossroads” the difficulties addressing fundamental issues, such as those raised by the H-P/Compaq and Enron cases, with the concepts, models, and tools developed in the intangi-
bles (intellectual-capital) field. Why do we encounter these difficulties?

3. The Inertness and Commoditization of Intangibles

Intangibles are inert by themselves, they neither create value nor generate growth. In fact, without efficient support and enhancement systems, the value of intangibles dissipates much quicker than that of physical assets. Examples of inertness:

- Highly qualified scientists at Merck, Pfizer, or Ely Lilly (human capital intangibles) are unlikely to generate consistently winning products without innovative processes for drug research, such as the “scientific method” which is based on the biochemical roots of the target diseases. Even exceptional scientists, using the traditional “random search” methods for drug development will hit on winners only randomly.

- A large patent portfolio at DuPont or Dow Chemicals (intellectual property) is by itself of little value without a comprehensive decision support system that periodically inventories all patents, slates them by intended use (internal or collaborative development, licensing out, or abandonment), and systematically searches and analyzes the patent universe to determine whether the company’s technology is state-of-the-art and competitive, and who infringes on the firm’s intellectual property.

- A rich customer database (customer intangibles) at Amazon or Circuit City will not generate value without efficient, user-friendly distribution channels and a highly trained and motivated sales force. Worse than just inert, intangibles are very susceptible to value dissipation (quick amortization); much more so than other assets. Patents that are not constantly defended against infringement will quickly lose value due to “invention around” them. Highly trained employees will defect to competitors without adequate compensa-

tion systems and attractive work place conditions. Valuable brands may quickly deteriorate to mere “names” when the firm loses competitive advantage (e.g., Xerox, Yahoo!, Polaroid). The absence of active markets for most intangibles strips them of value on a stand-alone basis (certain patents and trademark are exceptions). Evidence the billions of dollars of intangibles (R&D, customer capital, trained employees) lost at all the defunct dotcoms, telecom companies, or AOL, which announced in January 2002 a whopping write-off of $54 billion of mostly intangibles.

Intangibles are not only inert, they are also, by and large, commodities in the current economy, meaning that most business enterprises in a given sector have equal access to them. Baxter, Johnson & Johnson, along with the major biotech companies have similar access to the best and brightest of pharmaceutical researchers (human capital); every major retailer can acquire state-of-the-art supply chains and distribution channel technologies, capable of creating supplier and customer-related intangibles (e.g., mining customer information); most companies can license-in patents or acquire R&D capabilities via corporate acquisitions, and brands are frequently traded. The sad reality about commodities, tangible or intangible, is that they cannot create considerable value. Since competitors have equal access to such assets they, at best, return the cost of capital (zero value added).

5. A Conceptual Framework

My notion of organizational infrastructure derives from macroeconomic growth theory, particularly from the “total factor productivity” (TFP) concept. Economic growth theory deals with the economic development of nations, with special focus on the drivers of growth. The drivers of economic growth, measured for example, by GDP change, can be divided into: (a) increases in factor inputs, such as growth of the labor force and capital investments (property, plant and equipment), and (b) improvements in TFP – the productivity of the combined factor inputs. For example, the gross product of U.S. corporate businesses increased in 2000 (relative to 1999) by $443.2 bil-

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lion, while consumption of physical capital increased by $57.9 billion and the compensation of employees by $289.1 billion. How did aggregate spending of $347.0 billion on capital and labor in 2000 increase gross product by $443.2 billion? Where did the $100 billion value added come from? The answer: Total factor productivity business processes, organizational designs and incentive systems, enabling the corporate sector to generate an output level substantially higher than invested inputs.

I define corporate organizational infrastructure, with required modifications, as the microeconomic analogue of total factor productivity (TFP). Organizational infrastructure that is, management processes, organizational blueprints, incentive and control (corporate governance) systems when operating successfully, enables management to generate excess product out of invested resources. This excess product relative to invested inputs reflects the productivity edge of the enterprise, the source of shareholder value and employee welfare. Figure 1 depicts the central role of organizational infrastructure in the business value-creation chain. It enables the enterprise to use its resources in a productive manner, which in turn enhances company productivity, profits, and shareholder value. This approach considers both tangible and intangible capital (R&D, customer-related intangibles), isolating organizational infrastructure from all other corporate resources, most of which, I argued, are inert and commoditized. This emphasizes the unique nature of organizational infrastructure. It’s not an asset or capital, as many believe, rather it’s an enabler of all other assets, tangible and intangible, performing their intended roles in the value creation chain (see Figure 1).

### 6. Measurement

What do we know about that all important intangible organizational infrastructure (OI)? Admittedly, very little. The management literature and business media frequently tout new managerial processes and organizational designs, some of which fade away after the initial excitement. But systematic knowledge about OI is scarce. To gain quantifiable insights into the value and impact of OI, I developed with Suresh Radhakrishnan a methodology for valuing firm-specific OI, depicted in Figure 2 (see Lev/Radhakrishnan 2002).

We estimate statistically for a sample of about 300 public companies the contribution to revenue growth of the four major resources: physical assets, labor, brands, and R&D the investment in each is derived from companies’ financial reports. It is clear from the data that some companies are more productive than others, being able to generate higher revenue growth from a given level of resources. We attribute this firm-specific productivity to organizational infrastructure, and estimate it statistically by quantifying the contribution of organizational infrastructure to product growth. Our methodology thus defines OI in terms of the productivity of deploying the company’s resources, and values OI from observed sales growth, given invested resource, as is done in national accounts with total factor productivity (TFP).

Figures 3 and 4 present for selected companies the average annual contribution of OI to product growth over 1994–97 (dark grey bar) against subsequent stock performance over 1997–99 (light grey bar). The three companies...
in Figure 3 are in the chemical industry. Dow Chemicals had a larger increase in OI than DuPont during 1994–97, and was accordingly rewarded by a larger shareholder value increase in 1997–99. FMC Corp. had a decrease in OI and a subsequent negative stock return. The companies in Figure 4 are in the retail sector. Wal-Mart and Home Depot with large increases in OI and commensurately large subsequent stock returns, while K-Mart suffered a significant loss in OI and a subsequent loss in shareholder value. Our measure of organizational infrastructure thus captures real growth potential, which is reflected in subsequent years by shareholder value creation.

### 7. Managerial and Investment Applications

The contribution of organizational infrastructure to enterprise productivity is essentially a reflection of managerial capabilities and their execution. Organization and execution are what management is all about. Despite oceans of ink, the quantification of managerial capabilities remains elusive. Vague terms like leadership, focus, or knowledge workers abound, but they don’t significantly advance our ability to evaluate managers’ capabilities and success. The OI concept discussed here does just that. Grossly simplifying, if both companies A and B increase capital investment from 100 to 110 units, while A’s product grows 10% and B’s 20%, the inescapable conclusion is that B’s management was more capable and successful than A’s. Thus, the extent of managerial capabilities and execution success can be measured by the OI approach of relating productivity growth to resource increases, and focusing on the residual-enabler.

The ability to estimate the value of companies’ organizational infrastructure provides new valuation and control tools for managers and investors. Given space constraints, I will briefly describe just three examples.

- **Productivity of IT:** The over-investment of the corporate sector in

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information technology during the 1990’s and the almost complete cessation of IT growth in the last two years, emphasize the need for a rational assessment of the productivity (return on investment) of IT. Since IT primarily enables organizational infrastructure (e.g., the IT underlying supply chains or distribution channels), its productivity can be inferred from the relation between IT expenditures and the corresponding growth in the value of OI. For example, in our sample, Home Depot had a ratio of 1997–95 increase in OI to total IT investment of 0.51, while Wal-Mart’s ratio is 0.16 only. Thus, Home Depot’s return on IT in the mid-1990s appears to have been substantially higher than that of Wal-Mart’s.

**Management compensation**: The contribution of organizational infrastructure to the company’s product growth is, as I argued above, a quantification of management’s capabilities and execution success. It is, therefore, compelling to base part of managers’ compensation on that value. While our research shows that there is a strong correlation between OI and stock performance, it’s not a perfect correlation. OI is less susceptible to factors beyond the control of management (e.g., interest rate changes, tax changes) than stock prices, and therefore is a more suitable driver of managers’ compensation.

**Investors’ valuation of management capabilities and growth prospects**: Surveys indicate that the assessment of management capabilities is at the top of the wish list of financial analysts and institutional investors. Traditional performance measures, such as earnings or cash flows are subject to widely known limitations (e.g., prone to manipulations, biased by the expensing of intangibles, ignore the cost of equity capital, etc.), and are therefore noisy indicators of managerial capabilities and performance. The organizational infrastructure measure discussed above provides a sharp focus on managers’ performance and the company’s growth potential, by indicating abnormal productivity gains derived from given company resources. Our research indicates that when we form portfolios of companies with high and low OI values, the abnormal (risk-adjusted) returns on these portfolios in the two years subsequent to portfolio formation are: 3.0% vs. 1.5% and 2.5% vs. 1.3% in favor of the high OI companies. Investment in good management, as indicated by the OI measures, clearly pays.

### Keywords
- Intangibles
- Intellectual Capital
- Organizational Infrastructure
- Performance Measurement

### Zusammenfassung

### Stichwörter
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- Intellektuelles Kapital
- Organisationskapital
- Performance Measurement

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### 8. Agenda for the Intangibles Movement

Productivity of scarce resources is the top priority of nations and business enterprises. Increased productivity of resources (capital, labor, R&D) is the major driver of nations’ welfare (standard of living, employment), and of companies’ profits and shareholder value. A focus on productivity at the national and business enterprise levels appears, therefore, appropriate for people concerned with intangibles, given that in modern economies and companies intangibles are the major drivers of productivity.

Current concerns, such as the valuation of specific intangibles (patents, brands), or the codification of tacit knowledge, while useful, are in my opinion of secondary relevance, subordinate to the overall productivity or efficiency enhancement goal. An intellectually-stimulating and highly useful agenda for the Intangibles Movement is accordingly to “peel off” the OI onion. Here are several concrete issues for study.

- What are the organizational structures of R&D activities most conducive to success? What specific blueprints and underlying processes of R&D yield the highest number of patents and innovations, and the largest share of revenues from recently introduced products?
- What are the systems used by companies to successfully enhance brand values? Why do some brands (e.g., Coca Cola, Marlboro) maintain their value, while others (Polaroid, Xerox), fall by the wayside?
- What is the impact of corporate network alliances, partnerships and joint ventures on the productivity of companies? What is the optimal structure of such networking for achieving specified objectives (e.g., conducting research, sharing risk, selling products)?
- Develop measurement and reporting systems for evaluating the productivity of resources, particularly intangible ones: Assess the returns on investment in R&D, brands, IT, and human resources; and develop reporting modes for the productivity of these assets.
- What are the compensation systems and work practices that generate the highest productivity of human re-
sources? How can employee productivity, particularly in service organizations be measured?

- How do successful enterprises develop their organizational structures and keep them unique? How to prevent competitors from quickly imitating such designs?

- The pace of knowledge accumulation: How are new knowledge and technologies adopted and diffused within the organization? Under what circumstances are old technologies abandoned and new ones adopted?

- What are the organizational impediments to knowledge creation and the adoption of new technologies and operating systems? How best to overcome the forces of the status quo?

- The collapse of Nasdaq demonstrated the vulnerability of intangibles, particularly OI. How can companies protect their intangibles? How can the risks inherent in intangibles be shared and minimized? What are successful measures of risk exposure?

Certain aspects of this research agenda are conducted in other areas economics, management, sociology and organizational behavior. It will be highly useful to assemble available research and emerging work under the umbrella of the Intangibles-Organizational Infrastructure undertaking.

The proposed Phase II of the Intangibles Movement focuses on the organization's role in enhancing the productivity of nations and business enterprises, and the welfare of citizens and shareholders offers a socially useful and intellectually stimulating agenda for people interested in intangible assets. Using Nike’s slogan Just Do It.

References


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Die „Balanced Scorecard“ ist ein ganzheitliches Steuerungskonzept für Unternehmen mit Hilfe von Kennzahlen für folgende vier Bereiche:

- Finanzielle Ergebnisse
- Prozesse und deren Qualität
- Innovation
- Kundenzufriedenheit

Somit erfasst die „Balanced Scorecard“ nicht nur finanzwirtschaftliche Aspekte, sondern berücksichtigt auch qualitative Faktoren und ist damit ein zukunftsorientierter Management- und Controlling-Ansatz.

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