Scaling the Global Competency Cube:
“Mind Matrix” Measures and Emergent Issues

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This paper extends the conceptualization of the “Global Competency Cube”, which is a balanced set of cultural, functional, and product competencies. It is presented as a useful heuristic in the task of providing human resource applications to support Bartlett and Ghoshal’s (2000) transnational strategy and attendant “mind matrix” concept (Engle, et al., 2001). Assessing, developing, and culturally emphasizing a balance of these three competencies will result in those human capacities essential to ensure the transnational capabilities of global standardization, local customization, and the diffusion of innovation.

Transnational firms primarily focus on a person-based balance of cultural, functional, and product competencies – rather than jobs and organizational design and structure – as the primary control mechanism to insure strategic success (Boudreau, Ramstad and Dowling, in press; Engle and Stedham, 1998; Evans, Pucik and Barsoux, 2002). This paper outlines basic issues of measuring cultural, functional, and product competencies and also provides a five-phase competency assessment model for a focal firm.

GLOBAL COMPETENCIES AND TRANSNATIONAL DECISION SUPPORT SYSTEMS

A global competency space, comprised of cultural, functional, and product competencies (breadth and depth), creates the parameters upon which a decision support system (DSS) may be created (Engle, et al., 2001). The global competency cube (GCC) is envisioned as a computer-based DSS consisting of a tripart (cultural, functional, and product) database containing information on the work assignments, experiences, and certifications required to identify the cultural, functional, and product related capabilities of each employee. How are these capabilities to be recalled and used to help make IHR decisions?

The system presented by Engle and Mendenhall (2001) is based upon the degree of match between the competency mix (that combination of cultural, functional, and product experiences)
required for a given assignment and the competency mix of the individual employees whose personal experiences are mapped into the system. For example, a decision-maker would be asked to respond to a series of prompts and/or drop down boxes in order to describe a potential assignment in terms of the cultural, functional, and product breadth and depth required for that assignment.

The decision-maker would then describe the level of match, or proximity of fit, between the desired dimensional coordinates and the coordinates of employees captured in the competency database. Based on these competency coordinates the system would search the database for employees whose experiences come closest to meeting the desired competency mix and queue selected individuals by overall level of match for review by the decision-maker.

At the same time the decision-maker would also describe the characteristics of the compensation package available for the assignment. The compensation model applied is based upon Milkovich and Bloom's (1998) three-part compensation construct. In this model international compensation is comprised of "core" elements common to all employees globally. This ensures a standardized and "basic level of service and benefits" in addition to "crafted" or "customized" elements that vary by business unit or geographic region and "choice" elements that allow an individual employee to select compensation elements in a flexible, personalized manner (Milkovich and Bloom, 1998: 22).

In the present paper, the authors address the issues of scaling such competencies for use in the DSS outlined above. In the next section, we present a brief discussion of competencies as envisioned for the global competency cube.

A Perspective on Competencies and the GCC

There are many conflicting perspectives on “what competencies are and what they are suppose to accomplish” (Milkovich and Newman, 2002: 165; also see Bramming and Larsen, 2000). Our perspective on competencies stems from the strategic intent of the GCC and the
many and varied potential uses of a transnational decision support system (Engle and Mendenhall, 2001). A transnational perspective on competencies focuses on customized, concrete, and parsimonious qualities.

By customized, we mean strategically relevant, strategically distinctive competencies, which are personal capabilities that “direct behavior toward organizational objectives” (Milkovich and Newman, 2002: 170). Generic laundry lists of personal qualities are not as useful (Ledford and Heneman, 2002).

By concrete, we mean competencies that lend themselves to accurate assessment and widespread acceptance; that is competencies that are as behavioral and objective as possible. By focusing on more concrete skills and experiences we facilitate both validity in assessment and acceptability of results on the part of widely diverse employee groups. Performance management in multicultural contexts is fraught with problems and the potential for miscommunication (Audia and Tams, 2002; Dowling, Welch and Schuler, 1999: Chapter 4; Lindholm, Tahvanainen and Bjorkman, 1999). In focusing on more concrete “skills and knowledge” or “business related descriptors of behaviors” and avoiding deeper (almost always inferred) “self concepts, traits and motives” we can minimize cross-cultural confusion due to attribution error (Milkovich and Newman, 2002: 167-170).

By parsimonious, we mean competencies that are limited in their complexity. Transnational firms are complex organizations; a certain level of complexity is essential in firm operations (Galbraith, 2000; Nohria and Ghoshal, 1997: Chapter 9). By limiting the number of primary competency dimensions we can more efficiently communicate with and direct employees as they acquire and develop relevant competencies (Ledford and Heneman, 2002).

**Processes for Scaling and Operationalizing Competencies**

The process of defining and assessing relevant competencies is a daunting task for any firm, but promises to be particularly complex and dynamic for global firms (O’Neill and Doig,
We propose a very general five phase process for determining firm-specific cultural, functional, and product competency spaces; auditing existing resources, evaluating activity flows; inventorying IHR competencies; and reviewing and revising these competency results. A phase-by-phase review of activity goals, actors, and methods is given in Table 1.

In Phase I, “Strategic Mapping,” the goal is to determine the strategic domain envisioned by the executives, which consists of those products, markets, and functions that make up the competitive arena now, or in an intended future. Researchers will query the CEO, the top executive team, and other internal or external strategic partners by way of interviews and a content analysis of organizational documents. Much of this material may very well be confidential. At the end of this phase, the research team will understand the parameters of corporate strategic activities and the drivers of strategic capability, and will see how these drivers are intended to be used in concert. By determining core strategic competencies and articulating basic competency sets, the researchers may more efficiently focus on pursuing strategically relevant competencies rather than the competencies that individuals or units may want to promote as part of their own agendas.

In Phase II, “Resource Location Audit,” the goal is to determine the geographic “address” (location) of the firm’s resources. Where are production, marketing, research and development, distribution, logistics, and financial activities located? Finally, where are the various human resources located and what is their status (full time or part time employee, outsourced contractor, joint venture resource, etc.) in the firm? Again, researchers will query top-level management as well as regional, functional, and product executives by way of interviews and reviews of archival data as well as organizational reports. This inventorying is necessary to determine who the
researchers need to contact in subsequent phases and the best way to contact the appropriate individuals as well as to get a sense of the firm’s activities and operations.

In Phase III, “Process Flowcharting,” the goal is to map the flow of assets (resources) and determine how extensively these resources relate to (integrate with) each other. The goal here is to understanding the tempo, pace, volume, packaging, and regularity of resource flows across products, markets, and functions (Bartlett and Ghoshal, 2000). For example, how often do cost accountants operate across units in real or virtual teams? Researchers would query mid-level executives for this information, particularly those managers acting in integrating or liaison roles. This workflow analysis would be the result of interviews, questionnaires, analysis of existing documents, and traditional methods of process assessment.

In Phase IV, “Competency Assessment (Inventory),” the goal is to specifically describe competency sets and behavioral descriptors of competencies across the entire firm. Competencies can be expressed based on some combination of experience-based inputs, activity-based processes or achievement-based outcomes (Engle and Mendenhall, 2001).

Archival data, which details experiences over time or, alternately, focuses on the achievement of results (functional-product projects in cultural locations at a given time), is one potential method of competency assessment. Another method, certification, can consist of competency examinations and/or testimonials from knowledgeable and trusted members of the organization. Certification can be seen as the external verification of previous experiences, an integral part of activities or the process of archiving achievements.

We suggest that as a general rule competency breadth may best be determined from inquiries of top and mid-level management within the local unit, while competency depth may best be determined from inquiries of lower-level operational management. However, the exact location of a more complete and unbiased understanding of these competencies will vary by firm. This rich and detailed information may be gathered from a wide variety of sources. These
would include interviews of incumbents, coworkers, and supervisors; questionnaires; observation methods; and an analysis of relevant human resource documentation such as job analysis, job descriptions, performance assessment and training materials.

Phase V, “Review and Revision”, is a reverse direction exercise in validity checking and clarification. In this phase, the detailed information obtained in Phase IV is reviewed and modified by middle management (to assess results as related to process flows); top level management (to assess results as related to resource locations); and the CEO, executive team, and strategic planners (to assess results as related to strategic intent). The ultimate goal is to build a common set of metrics, a shared, understood, and accepted competency vocabulary. Given the outline of this process, what do we mean by cultural, functional, and product competencies?

**Defining Cultural Competencies**

Scaling for the Global Competency Cube, most particularly scaling cultural competencies, is not viewed as a complete, encyclopedic listing of all states that may exist for a given dimension. We are not engaged in a definitive exercise in global cultural anthropology. Rather, the scaling activities are designed to capture the dimensions that are strategically relevant to the focal firm. Using interviews, observations, and the assessment of archival data, researchers may create frames for metrics that support a strategically relevant and firm specific competency audit. With this overarching goal in mind, we present three potential approaches to scaling cultural breadth.

**Cultural Breadth**

The three alternative approaches to cultural breadth are the “Horizontal and vertical individualism and collectivism” (HV/IC) approach, the “Developing and developed economies” (DG/DD) approach, and the “Cultural distance” (CD) approach. These approaches are related to the level of strategic entry for the focal firm. The HV/IC approach would most likely be used by
firms with an extensive experience in operations across a wide range of cultures; the DG/DD approach would be used by firms in industries and markets where level of economic development determines the focus of activities (Galbraith, 2000: 191-193); and the CD approach would be useful in firms with strong domestic activities and/or relatively recent and limited operations in a narrower set of diverse cultures.

Model A: Horizontal and vertical individualism and collectivism

This model is based on Triandis’ (1995; 2002) presentation of Hofstede’s (1980) original dimensions. According to Triandis, individualism and collectivism are “polythetic constructs” capturing many aspects of “a large number of species” and comprise a potentially robust univariate scale (2002: 23). Triandis refers to “horizontal and vertical” cultures which combine individualism and collectivism with “power distance” (Hofstede, 1980) to present a typology of four kinds of cultures: horizontal individualists, such as Austria or Sweden, vertical individualists, such as U.S. corporations . . . , horizontal collectivists, such as the kibbutz, and vertical collectivists, such as India or China.

(2002: 25)

Our cultural breadth scale in this model would range form vertical individualism (VI), to horizontal individualism (HI), to vertical collectivism (VC) to horizontal collectivism (HC). See the horizontal array at the top of Figure 1 for a scale of this first model of cultural breadth.

INSERT FIGURE 1 APPROXIMATELY HERE

Model B: Developing and developed economies

In situations where a firm’s strategies are not based on distributional distances or historical patterns of consumption, but rather on technological and economic infrastructure, scaling cultural breadth may best be presented in a sliding scale based on level of economic development (Galbraith, 2000: 191-192).

According to Galbraith (2000) for firms in industries acting in both “emerging markets” and advanced capitalized markets – such as the financial services industries or contrasting
mature and deepwater fields in the petroleum exploration industry - it makes sense to organize work more around these differences (191-193). Here, our proposed scale would range from High opportunity for Developing economy (HDg), to Developing (Dg), to Developed (Dd), to Highly Developed (HDd). Again, see the second row of cultural breadth on the top of Figure 1 for the display of this method of scaling.

**Model C: Cultural distance**

In cases where the firm is new to globalization, anchoring competencies on the parent culture and scaling relative cultural “distance” from this “home” cultural anchor may be useful. “Cultural distance” (Triandis, 2002) and the related constructs of “cultural novelty” (Black et al., 1991; Torbion, 1982, 1987) and “cultural toughness” (Mendenhall and Oddou, 1985) have to do with the level of differences in underlying cultural assumptions and values between a home culture and other cultures and the attendant adjustment required to identify and successfully cope with these central differences. Zeitling (1996) used cluster analysis techniques on Hofstede’s (1980) original data to scale these differences and derive national comparisons. Our proposed scale would range, reading left to right, from parent culture (P), to close (C), intermediate (I), and distant (D) cultures. We can “fine tune” the geographic unit of analysis within this model (region, national, or local area) as required by the firm’s strategic interests (Boudreau, et al., in press: 26). Note the third row of cultural breadth on the top of Figure 1 for the display of this method of scaling.

**Cultural Depth**

Cultural depth refers to the length and task complexity of an international assignment as well as the requirement to work closely with coworkers from different cultural backgrounds (Engle, et al., 2001: 349). Scaling depth is envisioned from “shallow” to ”deep” starting with 1) “Outsider” – read about or otherwise vicariously experienced the focal culture, but never visited; to 2) “Visitor” a) short term, to b) intermediate term visitor to c) long term visitor; 3)
“Expatriate” a) short term, to b) intermediate term, to c) long term expatriate; to 4) “Native” a) naïve, to b) informed, to c) expert native. Language capability may be considered an independent indicator of cultural depth, or alternately, integrated into the scale above.

Within this depth scale (from Outsider to Visitor to Expatriate to Native) the authors present the issue of cultural “focus” within cultural depth. By cultural “focus” we mean the degree to which the international experiences, assignments, etc. expose the employee to a limited “local” task group alone (task focus), the overall organizational culture within the country or region (organizational focus), and/or the greater societal culture (macro focus). See the embedded vertical scales in Figure 1 for a visual representation of this aspect of the model.

A case example may clarify these distinctions. It is hypothetically possible that a project group consisting solely of Swiss engineers could be given a three-week assignment in Brasilia, Brazil and never leave the confines of the work facility. The nature of the experience would provide the team members with minimal exchange and interaction with local engineers, the greater organization in Brazil or (having meals catered in) even the city and society of Brasilia. The only “local” experience they could have would be the taxi ride from and to the airport.

Alternately, this same team could work closely in an intercultural task team with local Brazilian engineers (in-depth task focus), make extensive formal and informal contacts with many members of the local organization (in-depth organizational focus), along with extended formal and social trips throughout Brasilia and the surrounding Brazilian countryside as well as the cities of Rio de Janeiro, Sao Paulo, Belo Horizonte, and Recife (in-depth macro focus). Other assignments and cross cultural experiences could be complex combinations of depth and shallowness across task, organizational, and macro foci.

This combination of depth and focus forms the basis for scaling experiences encompassing local corporate as well as greater environmental cultural understanding.

**Defining Functional Competencies**
On first glance, functional competencies may appear the most traditional area for competency scaling. Skills-based pay systems in the US go back to the early 1970’s (Lucia and Lepsinger, 1999; Walton, 1972). However, global functionality may best be captured using the “value chain” business process concept (Boudreau, et al., in press). The “value chain” model consists of “the transformation processes that comprise the ways that an organization creates value,” such areas as “procurement, manufacturing, packaging, sales, distribution, and service, supported by processes such as information systems, legal, and HR.” (Boudreau, et al., in press: 13-14). Auditing the functional breadth would provide information on the range of functional capabilities required to compete and meet customer requirements via “innovation, operations, sales, and service” (Boudreau, et al., in press: 25, 53). Figure 2 provides a graphic representation of functional breadth along the horizontal axis and functional depth along the vertical axis of the competency space.

**INSERT FIGURE 2 APPROXIMATELY HERE**

Functional depth scaling would vary tremendously based on the focal breadth activity. Generic anchors, ranging here from shallow to deep, such as “Meets baseline expectation” to “Competent/ Proficient” to “Advanced/Coach” to “Expert/Mentor” may be applied; alternately more process specific anchors may be applied (Lucia and Lepsinger, 1999; Milkovich and Newman, 2002: 175-179). More specific statements on functional breadth and depth are so much a function of firm-specific strategy that we will not extend the discussion of this dimension in this paper.

**Defining Product Competencies**

The guiding concern for the product portion of the cube is identifying the product-related competencies of each employee and matching them with the product requirements of the job assignment. We envision a manager describing the job assignment in terms of the market/industry involved and the degree of newness of the product. As such, the product
The competency portion of the cube is, in part, a proxy for industry and market (customer) knowledge as suggested by Galbraith (2000). The market knowledge components comprise the breadth or horizontal axis of the product competency matrix. These include the consumer, producer, reseller, and governmental/institutional markets.

Product depth knowledge within each of these market categories centers on the level of newness of the product involved in this job assignment. The degree of newness must be viewed from both firm and customer perspectives. The newness categories forming the vertical axis include a reposition, a minor improvement, a line extension, new category entry, a dynamically continuous (incremental) innovation, and a discontinuous (radical) innovation. This portion of the cube is a proxy for the product life cycle stage of the product and for the stage of the product in the firm’s new product development process.

The current generation of our cube builds on the earlier product conceptualization presented in Engle, et al., (2001). That conceptualization focused on developing scenarios for adding product lines (product breadth) and decisions regarding the addition of product items to each line (product depth). As the firm moves from multinational to transnational, product competency requirements will increase in both depth and breadth.

By contrast, the current evolution builds on that view by embedding line and item decisions in each cell of the product competency matrix. This approach broadens the strategic view by including all potential market levels as well as all value chain activities and all potential technology requirements. It allows a manager to describe a job assignment in terms of the depth and breadth pictured in a 6 X 4 matrix with 24 cells (see Figure 3 for the axis and decision variable designations).

This second approach is warranted for several reasons. Because product life cycles are getting shorter, global market development is becoming more important to the value of the firm.
Our approach defines levels of markets and necessary skills involved in targeting these markets. Considering the world as a market, different products are in different life cycle stages at any given time. This requires competencies in segmenting a market and reevaluating the membership of each segment (Kumar and Nagpal, 2001).

Because competitive advantages do not last long in most industries, it is critical to develop the best process for new product development (Galbraith, 2000). Such a process should incorporate the degree of newness to both the company and the market. Our approach in defining an employee’s past skills and future needed skills by degree of newness involved would more effectively define the person’s competency level needed for a particular project or task.

Because of the increase of concurrent design/simultaneous engineering, multiple functional areas are often involved in a product design before “design freeze”. This creates a need to assign people to teams early in the development process and requires a need to know the employees’ specific background skills. Our approach will work for both companies who view the value chain as a link of sequential activities, each requiring a different skill set from employees, and for those who view the chain as a cross coordination of employees from different functional areas (such as involving the marketing people in design, manufacturing, and other value creating activities).

**Product Breadth**

A person receiving a job assignment based on this approach should know the characteristics of each type of market, including the nature of the buying unit and buying process as well as the types of goods and services normally developed for this market. The consumer market (PB1) consists of individuals or groups of individuals who buy goods and services for end-use purposes. The producer market (PB2) consists of organizations that buy for use in the production of other goods and services. The reseller market (PB3) consists of organizations that purchase products for resale. The government/institutional level (PB4) includes governmental
organizations at all levels, and institutions such as hospitals and schools. All of these markets can exist at the local, regional, national, or international levels.

Given the differences in the markets, the knowledge and experience needed to develop and market products to the consumer market will not be sufficient in the producer, reseller, and governmental/institutional markets. These markets have more complex buying processes as well as adoption and diffusion processes which differ from those of the consumer market. In addition, separation of the business markets from the government/institutional market in this matrix is needed because the governmental/institutional market has additional characteristics and needs, such as the negotiated bid buying process (Kotler, 2003).

**Product Depth**

The depth axis incorporates degree of newness from both firm and customer perspectives. A firm views newness and innovation in their products at three levels of risk, incorporating whether the product is new to the market but not new to the company, new to the company and not new to the market, or new to both company and market. From the firm’s point of view, the level of risk can be viewed as a continuum, beginning with a product reposition. The least risky levels are separated in this matrix because the knowledge required to effectively execute a change in strategy can differ at each level.

A *repositioned* product is one that is retargeted for a new use or application. It may involve either an image change in the current market or a new market or set of customers from the viewpoint of the firm. A reposition does not involve a real change in the product. Examples include “Orange juice – it’s not just for breakfast anymore” and Kellogg’s removing the green loops from its Froot Loops cereal for European markets (Soloman and Stuart, 2003).

A *minor improvement* is a type of continuous innovation that improves a current product. It can involve quality, feature, or style improvements such as a color change, a package change, a lower cost for similar performance, improved performance at the same cost, or new ingredients.
A line extension is a type of continuous innovation that adds a new product item to an existing line, such as Liquid Tide (a household detergent originally in powder form). Both minor improvements and line extensions can be targeted to current or new markets (Crawford and DiBenedetto, 2000; Peter and Donnelly, 2004).

A new category entry is a product that establishes a new product line for the company. It may be targeted to an existing market which is new to the firm. Types include a “me-too” product that is already marketed by a competitor and a brand extension in which a company enters a new product category with an existing brand name. An example of a me-too in cell X32 would be a “drop-in” product which is the same as a competitor’s version and which can be dropped into a machine without retooling the machine. An example of a brand extension is McDonald’s Golden Arch Hotel or Ralph Lauren house paint resulting from a corporate licensing agreement.

A product that is a dynamically continuous innovation is a pronounced modification to an existing product that extends the frontiers of a technology’s usefulness; it may involve a new combination of existing technologies (Czepiel, 1992; Soloman and Stuart, 2003; Kerin, et al., 2003). Newness from the customer’s perspective pertains to the level of learning or behavior change involved. A dynamically continuous innovation requires a moderate amount of learning or change in behavior. An example of such a product is the electric toothbrush.

A product that is a discontinuous or radical innovation is both new to the company and new to the world; it involves a new technology. A radical innovation product can either change the whole character of an industry or create a new industry. It causes major changes in customer behavior, as examples such as television and the personal computer have clearly demonstrated.

Product Competencies Required for Each Cell – Moderating Variables

The exact nature of the competencies will vary across the matrix according to strategic intent and to which of the primary or support activities of the firm’s value chain the assignment
belongs. There are two main sets of moderating variables in each cell of the matrix: value
chain activity and product type. The firm’s value chain level also acts as a moderating variable
in the decision concerning which competencies are loaded into each cell. For example, if the
assignment originates in operations, the person receiving the assignment should have
competencies in operating cost structures (Czepiel, 1992).

Product type differs by type of market. For example, PB1 (and, in part, PB3) includes the
consumer product classifications by use or durability. These include convenience, shopping,
specialty, or unsought goods; durables or nondurables; and services. Business-to-business
products loaded into columns PB2, PB4, and, in part, PB3 include capital and accessory
equipment, maintenance, repair, and operating equipment, business services, raw materials,
processed materials, and component parts (Soloman and Stuart, 2003).

Product Competencies Required for Each Cell - Categories

Product type and value chain activity define categories of product competencies that will
be included in each cell. Five categories should be included: individual customer-related product
knowledge, product specific knowledge, product process knowledge, market/industry-related
product knowledge, and product-related measurement metrics.

*Customer-related product knowledge* includes elements not addressed in the culture
portion of the global competency cube. Elements include the nature of the customer’s buying
unit, the customer’s definition of value and drivers of liking in the relevant product category, the
customer’s reaction if a product item is deleted or changed, the customer’s view of adopting a
new technology, and how to communicate with or promote to the customer. For example, the
employee given an assignment may need to understand how an innovation is accepted and
integrated into an organization. The employee would need an ability to articulate the perceived
benefits of adopting the innovation (Frambach and Schillewaert, 2002).
Product specific knowledge is a broad category defining competencies. Competencies would be needed both internally from the firm’s viewpoint and externally from the market’s viewpoint. Elements include product design, variety and quality, service and warranty requirements, pricing strategy, understanding the key advantages of the product over existing products, branding strategy, holes in the current product depth and breadth of the firm’s lines, platform knowledge such as knowledge of the basic common design, understanding of the global nature of the product, and knowledge of product positioning strategy.

Process knowledge includes knowledge of the technical and design issues such as the product’s production process and logistics systems. For example, the employee may need knowledge of suppliers and other channel members. A relevant question would be whether the employee has ever negotiated with vendors.

Market/industry knowledge requirements would include elements such as knowledge of direct competitors, the keys to competitive advantage in a specific industry, a specific country’s product diffusion pattern, the country/market’s response elasticity, and knowledge of segmentation strategy. For example, the employee may need to know how consumers across the target country respond when prices change, or whether the country containing the target market is a fast adopter or a laggard (Kumar and Nagpal, 2001).

Measurement metrics include techniques used to measure any of the product-related elements in the matrix. For example, has the employee ever performed or does he/she have requisite knowledge of techniques, such as conjoint analysis, quality function deployment, cost-benefit analysis, risk assessment, product audits, customer satisfaction measurement, or profit performance?

Future Directions for Competency Scaling

This paper represents an intermediate step in the evolution of the global competency cube. In order to translate this descriptive approach to competency scaling to a form which will
allow the construction of a computerized decision support system utilizing a database approach, some additional steps need to be taken. These would include an examination of typical assignments in a focal company that is executing a product or other strategic decision. For example, what has an employee done in past assignments, what questions should be asked to measure the employee’s knowledge and skill level, and what scales should be used or developed to measure the competencies needed for a particular job assignment? It should be clear that answers to these and other related questions must be firm-specific rather than generic if the resulting DSS is to be useful to managers.

It should be also clear that as newness and/or unfamiliarity (of function, culture, and/or product) increases, more specific and special skills will be required for the job assignment. For example, Hall and Andriani (2003) discuss gaps in product knowledge that should be identified. These gaps impact the ability to identify features a successful product innovation should have. They also discuss a process of codifying tacit knowledge and a process for communicating explicit knowledge that could be adapted for developing product innovation competencies. Future research will involve identifying and incorporating these and other measurement issues in order to facilitate development of firm-specific databases and managerially useful decision support systems.

**EMERGENT ISSUES**

At least three significant issues emerge from this analysis. First, discussion and debate on the value of customized, concrete, and focused competencies is in no way meant to minimize the existence and potential significance of underlying self concepts, traits and motives. We liken these underlying “soft” competencies to a geyser’s “well spring” that constantly pushes up mineral-rich waters and leaves more solid residue on the sides of the geyser’s funnel. The more “solid” skills and knowledge are simply more readily measurable and more strategic in their focus, lending themselves to a more objective and systematic analysis.
Second, “dissecting” competencies that have existed in an overgrowth of synergistic abandon within individual employees is problematic (Bramming and Larsen, 2000). The fact that we choose to use value chain models as the basis for scaling both functional and product competency breadth means that some overlap is inevitable. This issue is less troubling when one considers that at some level these competencies are so intertwined – particularly in the case of firms which follow a pattern of strongly coordinated and interdependent activities – that we only need to insure the competencies are accounted for somewhere in the competency scaling process. Missing competencies are more troublesome than the potential of “double counting” a competency due to capturing an individual's competency element from a functional as well as a product perspective.

The third issue to emerge from efforts to date is more prosaic, and yet the most troubling. Competency scaling processes must deal with issues related to the aging and updating of competencies, certification and recertification; trust and the psychological ownership of the competency assessment process; and acceptance and communication of competency assessment results and outcomes. Timing of assessment and the aging of competencies is a significant issue in a rapidly changing competitive environment (Milkovich and Newman 2002: 174-179). How useful is a two year information systems assignment in Budapest in 1989 and 1990 in terms of today’s Central European environment? We must expand our realization beyond obsolescence of functional competencies and understand that all three categories of competencies must be constantly updated, expanded, and renewed in a timely fashion.

How can we insure that employees, at many levels and at many geographic, functional, and product locations throughout the firm, do not so “play the system” – either so underplaying or overselling their competencies – that the results become invalid? Which can we expect to come first, the transnational trust or the accurate, systematic assessment of transnational competencies that is at least partially pursued in order to build mutual understanding and trust?
Associated with this issue is the question of how to communicate and disseminate the findings of this system. If transnational firms are characterized by high levels of openness, transparency in operations and activities so units may communicate and transfer practices and processes, then how open should these competency results be to members of the firm (Barham and Heimer, 1998: 145-152; Evans et al., 2002: 351-364; Nohria and Ghoshal, 1997: Chapters 4 and 7)?

In the end, the courage which leads to human trust and a willingness to accurately communicate intensely critical and yet intensely personal self-revelations are central to the ability of any form of technology to support strategic intent. The head and the heart determine the use of the tool. Transnational strategies are as susceptible to the truth of this ancient relationship as any other organizational form.

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<td>IV  Competency Assessment Inventory</td>
<td>Scale Competency A. Breadth - B. Depth</td>
<td>Top and Middle Management</td>
<td>Interviews, Questionnaires</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lower and Operational Management</td>
<td>Observation, Original Human Resource Documents, Questionnaires</td>
</tr>
<tr>
<td>IV  Recycle and Revise</td>
<td>Review of Assessment by Interested Parties to Build Acceptance</td>
<td>All Parties Presented Above</td>
<td>All Sources Described Above</td>
</tr>
</tbody>
</table>
FIGURE 1

Cultural Competency Scaling

Cultural Breadth

VI: Vertical Individualism  HI: Horizontal Individualism  VC: Vertical Collectivism  HC: Horizontal Collectivism

HDg: High Opportunity for Developing  Dg: Developing  Dd: Developed  HDd: Highly Developed

P: Parent Culture  C: Close Culture  I: Intermediate Culture  D: Distant Culture

Cultural Depth

Outsider

Visitor:
- Short term
- Intermediate term
- Long term

Expatriate:
- Short term
- Intermediate term
- Long term

Native:
- Naïve
- Informed
- Expert

Focus Levels:
- Task Focus
- Organizational Focus
- Macro Focus
FIGURE 2
Functional Competency Scaling

Value Chain Activities

Innovation  Operation  Sales  Service

Competency Level

Baseline  Proficient  Advanced  Expert
FIGURE 3

Product Competency Scaling

<table>
<thead>
<tr>
<th>Product Depth</th>
<th>Product Breadth</th>
</tr>
</thead>
<tbody>
<tr>
<td>PB1:</td>
<td>Consumer</td>
</tr>
<tr>
<td></td>
<td>PB2: Producer</td>
</tr>
<tr>
<td></td>
<td>PB3: Reseller</td>
</tr>
<tr>
<td></td>
<td>PB4: Governmental/Institutional</td>
</tr>
</tbody>
</table>

PD1: Reposition
PD2: Minor Modification
PD3: Line Extension
PD4: New Category Entry
PD5: Dynamically Continuous Innovation
PD6: Discontinuous Innovation