



The Celemi Tango™ Business Simulation

- Success Through People -

An Update of the Conceptual Framework

Karl-Erik Sveiby



FOREWORD

THIS PAPER is intended for facilitators, who wish to understand more about the conceptual foundations of the Celemi Tango™ simulation. It addresses some of the hard questions that both new facilitators and customers may ask: Why do people and customers in Celemi Tango “behave” as they do? Does the simulation fit with reality? What is the empirical evidence for the way competitive advantage is simulated? What is the theory behind “Chemistry”? Does it make business sense to treat people well?



When Celemi founder and Chief Consultant Klas Mellander and I developed Celemi Tango almost 20 years ago it was the world’s first business simulation of a phenomenon, which most people had only vague ideas about. Since then, the business simulation has trained more than 70 000 managers around the world, making it one of the most spread board-based business simulations in the world. Celemi Tango simulates the business logic of what we today call the *Knowledge Intensive Firm (KIF)*. Knowledge Intensive Services have since been one of the fastest growing industry segments in Western industrialized economies, and its share of GDP and employment has grown from less than 10% in 1980, to more than 40% today in the trendsetting Nordic countries and the UK¹. As much as half the growth in the KIF sector is due to outsourcing of non-core activities from big corporations and public sector organizations.

The KIF business logic is also increasingly used as the model, which allows internal knowledge intensive service departments (R&D, IT, HR, Maintenance) in large organizations to become more effective.



New concepts have come and gone while researchers and practitioners have tried to make sense of this new world: knowledge work, TQM and BPR², corporate culture, core competencies, knowledge creating companies, learning organizations, knowledge intensive services, “our most valuable resource”, intangible assets, intellectual capital, war for talent, etc.

There is one common denominator here: **PEOPLE HAVE BECOME VERY IMPORTANT.** The management issue is: “how deal with this”?

Celemi Tango shows managers a systemic perspective of the whole firm to help them deal with the rapidly evolving, bewildering, business world – and in the simulation they learn to apply it.

The new tagline says it all: **SUCCESS THROUGH PEOPLE.**

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EXECUTIVE SUMMARY

RAPIDLY DEVELOPING research has introduced a multitude of concepts and new terminologies since Celemi Tango was launched almost 20 years ago. However, the “old” version’s basic functionality is still conceptually up-to-date. It has even been reinforced by recent empirical evidence, which confirms that a firm’s *workplace climate* (Chemistry + Competence in the simulation) has impact on customer’s perceptions about delivered quality (Image in the simulation). To make this insight a management option, “new” Celemi Tango allows Team Leaders to be put on “Advanced Training”. This improves workplace climate and thereby Image.

To simulate the Hi-tech KIFs better, the new version also includes an optional package of R&D cards, which gives teams the option to invest in two kinds of Information & Communication Technology (ICT) and introduces segmentation on customer markets. A couple of other minor amendments have also been done. To enable closer fit with the growing diversity of KIFs, New Celemi Tango includes an optional package of people cards with salary as first criterion. *Best fit* is introduced as new selection criterion for People.

Under its new dress, the original Celemi Tango remains the same. It simulates the whole KIF business from industry level down to the micro level service delivery chain so well, that the simulation can be framed to simulate almost any concept or management issue arising in a KIF. We know this from experienced facilitators’ practice, and it holds true also conceptually, for instance in the case of the Talent Management concept. Hence:

- *The simulated customers* still “behave” according to *Service Quality Theory* in B2B relationships.
- *The simulated people* still “behave” as *professionals*, today often called *knowledge workers*.
- *Competitive advantage* in the market place is still simulated according to the *Knowledge-Based View* – a variety of the *Resource-Based View*.

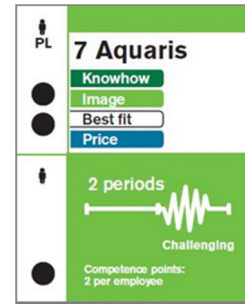
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THE CONCEPTUAL ORIGINS OF CELEMI TANGO

CELEMI TANGO'S CONCEPTUAL BASIS has three interlinked origins:

The simulated customers “behave” in Celemi Tango according to **Service Quality Theory** in B2B³ (Business-to-Business). Service Quality Theory was pioneered in the late 1970's-1980's by researchers in Sweden (Normann, Gummesson) and Finland (Grönroos, Strandvik) and it is today the dominant framework in services. The simulated firm represents a subset of the service sector – today often referred to as *Knowledge Intensive Services* or – when one emphasizes customers – *Knowledge Intensive Business Services*.



The simulated people “behave” in Celemi Tango as *professionals*, today often called **knowledge workers**. The theory is based on pioneering studies in USA on professionals (Etzioni) and their work practices (Schön). Those studies inspired pioneering research in the 1980's in Sweden on how to manage knowledge companies (*Sw. Kunskapsföretag*), today generally referred to as **Knowledge Intensive Firms⁴ (KIFs)**. They are organizations having primarily intangible assets and employing professionals, who offer expertise to clients (Sveiby, Ekstedt, Alvesson)⁵.



Competitive advantage in the market place is simulated according to the **Knowledge-Based View**, which is a variety of the *Resource-Based View⁶* on strategy. It differs from RBV in emphasizing the crucial role of individuals in creating knowledge, in converting knowledge to tools & processes and in applying knowledge in service to the customers⁷. This fits better with the reality of the knowledge intensive service industry. There are two markets in the simulation: The *People market* and the *Customer market* (pictured left).



The Celemi Tango company management builds competitive advantage on both markets through three *intangible assets*: *KnowHow-Value (R&D Value*

+ Competence Value), *Image Value* on the markets (=Service Quality as perceived by customers), and one tangible factor: *Price*.

RBV research has established⁸ that firms, which build their strategies on socially complex, path dependent, and causally ambiguous **intangible resources**, outperform firms that build strategy only on tangible assets. The intangible assets in Celemi Tango are designed accordingly: as *socially complex*, (influenced by how customers and personnel are developed and combined in projects) and *path dependent* (value is developed over long periods of time). In the interest of learning, a simplification compared to theory is made in that *causal ambiguity* is reduced considerably: In the business simulation, the effects of players' actions are measured and they have measurable causal effects on competitiveness of their intangible assets, the firms' financial results and *Market Values*. Measuring their value follows the theory of **measuring intangible assets** first developed by Sveiby & al. in 1989⁹ and the *Intangible Assets Monitor* further developed 1996-97¹⁰.

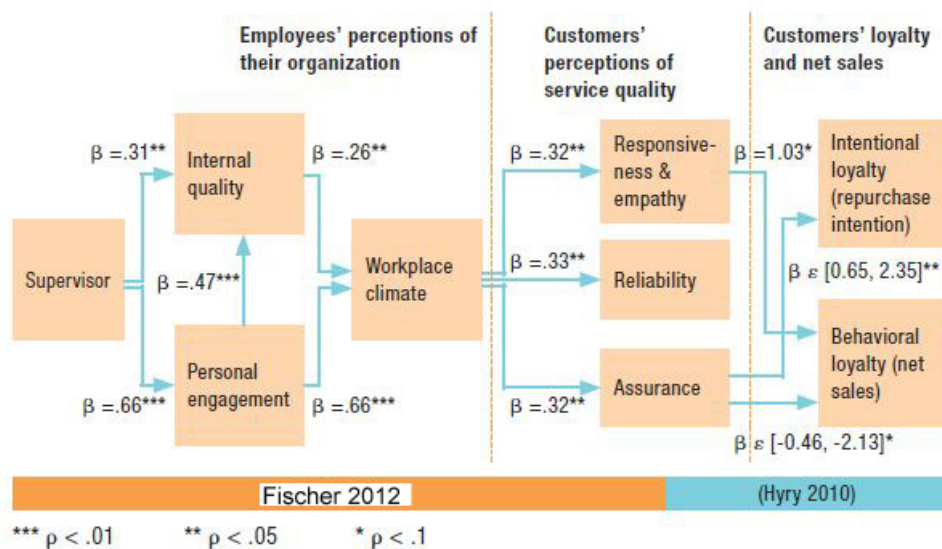
Klas Mellander combined the theoretical concepts in his physical “vehicle for learning”¹¹, when he and I joined forces in 1993 to create **Celemi Tango**.

CUSTOMERS

RECENT SERVICE QUALITY THEORY

THE LINKS between the *Service Provider's* (SP) service team and the customers' reactions in a B2B relationship have recently been studied thoroughly by two Finnish researchers. Their case is business units in Wärtsilä, the world leader in marine engines. Knowledge Intensive Services constitute 40% of volume and Wärtsilä has for many years been shifting their entire business logic from traditional manufacturing towards knowledge intensive services.

Figure 1. Service Quality in Knowledge Intensive Services¹².



Customers' loyalty and willingness to buy more services depend on their perceptions about the Service Quality delivered by the Service Provider. The customer perceives Service Quality in terms of *Responsiveness & Empathy*, *Reliability*, and *Assurance*. The *Workplace Climate* of the service provider's team influences the level of all three terms. The SP teams' *Workplace Climate*, in turn, depends on the SP's *Personal Engagement* and *Internal Quality*.

Service quality is tested when a critical event occurs. Unexpected (by the customer) positive actions by supervisors and teams (*positive deviant performance*) have a positive impact on the customer's perceived quality.

Fischer's and Hyry's studies¹³ establishes empirically for the first time in knowledge intensive services that in *B2B services employees' perceptions of their organization and its management*, predict customer quality perceptions, which in turn predict customer loyalty and company revenues.

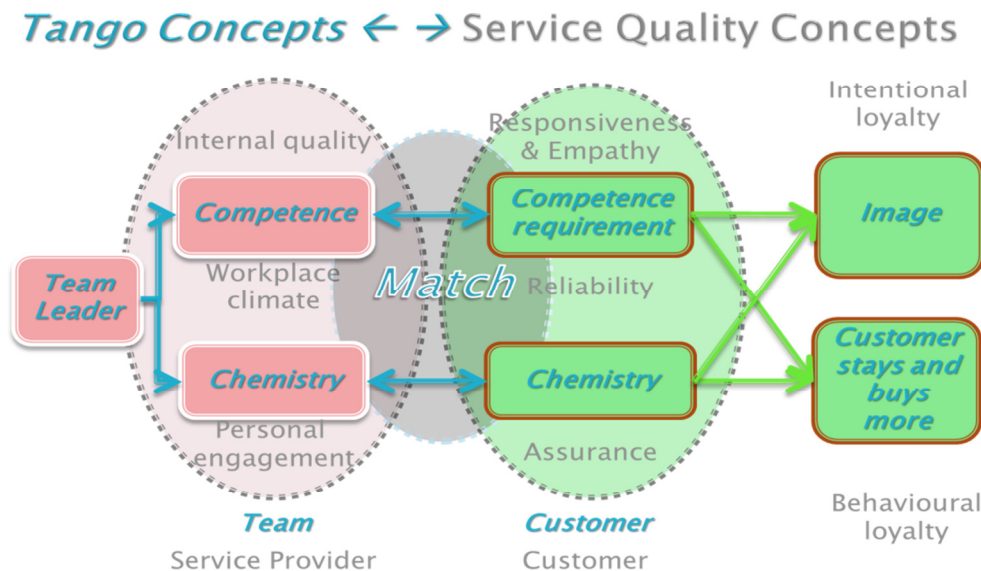
CONCLUSION: It makes good business sense to create a good workplace climate in knowledge intensive service business.

SERVICE QUALITY IN CELEMI TANGO

THE SERVICE QUALITY model in Fig. 1 sets the *Supervisor* as the main driver in influencing the Team's Workplace Climate and thereby Customers' perceptions about Service Quality. Wärtsilä also has account managers, and they influence customer perceptions, too. In Celemi Tango, the supervisor (called Team Leader) is one of the simulated persons. The account manager role is played by the human team's marketing manager.

Figure 2 compares the Celemi Tango model with Service Quality Theory. The models are almost identical, except that terminologies differ. In Celemi Tango the customer's perceptions about service quality is influenced by the *Chemistry* and the *Competence* of the whole team. The simulation assumes a close relationship with the customer's team. The *Match* between the customer's Chemistry and Competence requirements and the Celemi Tango Team determines the response of the Customer.

Figure 2. Comparison between Celemi Tango Concepts (blue texts) and Service Quality Concepts (grey).



In the business simulation, as in B2B service theory, it is the whole team that counts. In a B-to-B context customers create an overall opinion of the supplier and its personnel, which is not based on an individual employee's behavior or attitude.¹⁴

IMAGE – “REPUTATION IS EVERYTHING”¹⁵

Image in Celemi Tango is service quality seen from the customer's perspective. It is the *reputation* of the simulated company in the customer market, the *brand*. Image also influences the people market because people want to work for a well-known high-profile company. This makes image a competitive advantage on both markets. It even influences the market value of the firm; brand valuation is big business today.

UPDATE MADE IN THE SIMULATION

“**Advanced Training**” for Team Leaders is introduced. The aim is to improve their ability to develop a good workplace climate. After accomplished training, image is improved.

PEOPLE

COMPETENCE¹⁶ AND FLYING HIGH AND LOW

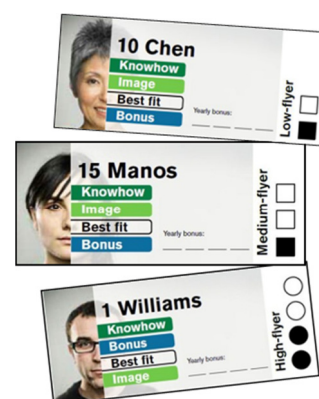
The simulated people in Celemi Tango are professionals with both professional expertise and technical skills, called *Competence* because the focus is on their ability to produce results. Competence is best developed through experiential learning – in Celemi Tango simulated by adding competence points and levels. *High-Flyers* have the potential to grow a lot; this is because they are the most ambitious at work, and they will leave if they are not developed. *Low-Flyers* are not stupid – only more ambitious elsewhere, perhaps with the family or as chairwoman of the sailing club. In the interest of simplification, the label does not change in the simulation whereas people in reality of course can change their ambition at work over time.

PEOPLE MARKET AND SELECTION CRITERIA¹⁷

Celemi Tango has feature, unique among simulations: A People Market, where highly qualified professionals “select” their future employer carefully based on criteria, which they prioritize. Some rank an environment rich in technology and competence highest, (*Knowhow*), some prefer an employer with a strong brand in the customer marketplace (*Image*), and some prioritize take home pay, (*Salary+Bonus*). They also wish to work in firm where they feel at ease with the climate; *Best fit* (=dominant chemistry) has been added and plays a decisive role when competition heats up on the people market. People are loyal if their employer fulfills their learning goals, but vulnerable to head-hunting if approached by a competitor offering better prospects, (= higher ranking on their selection criteria).

The simulation “executives” (=the human players) must develop strategies for both markets.

Variations of these four criteria rank high in most studies¹⁸ on how to attract and retain professionals. There has been little variation over time and among countries.



CHEMISTRY¹⁹ - ALL HAVE IT

People have an interpersonal skill, called *Chemistry* in Celemi Tango. The term comes from the concept *Interpersonal Chemistry* of Belbin’s team role inventory, which describes the ability to adjust one’s primary role identity to that of the others in a work group. The Myers-Briggs type indicator (MBTI) contains a similar concept, flexibility; the ability to adjust one’s basic personality type to the person one wants to communicate with. MBTI notes that in two-person relationships some personality types communicate better with each other than others and Belbin observes that the combination of some team role relationships have better prospects than others.

Celemi Tango does not prescribe a particular psychometric test, however. Instead, it simulates three generic different types of communication as shapes (triangle, square, and circle) in order to emphasize the importance of team compositions, where employees will communicate well with customers and vice versa. Customers have Chemistries too in the simulation. This simulates the B2B knowledge-intensive business service context, where also customer representatives are teams of professionals.

TALENT MANAGEMENT AND “THE WAR FOR TALENT”

IN 1998 A MCKINSEY QUARTERLY article warned about the intensifying competition for talented executives. The study claimed that —“The Old Reality” (people need companies) is being replaced by “The New Reality” (*companies need people*). People, not machines, capital or geography, is the new source of competitive advantage. The authors foresaw a “war for talent” caused by demographic trends, which create scarcity of executive talent. To win the war executives need to “elevate *talent management* to a burning corporate priority”.

Celemi Tango simulates many of the drivers that may lead to a War for Talent quite well: There is scarcity of good people and this leads to tough competition in the people market; people demand competence development, or else they leave, companies are vulnerable to poaching, the “executives” (=the human teams) sometimes feel desperate, etc. Celemi Tango shows that companies really do need people.

The article, just as the business simulation seminar, highlights the need to develop a brand and recruitment strategy to attract talent to fit its customer strategy. ***The issue is: what type of strategy?***

Because of its design, Celemi Tango allows a multitude of strategies for the people market; the “executives” (=human team) can choose to go to war for talent with high financial rewards to high flyers and aggressive poaching, or; to build a more evolutionary approach with one or all of their intangible assets for long-term competitive advantage, or; to focus on building a good working climate with selected customers, (*Chemistry fit*), or; any strategy in between.

The original article recommended corporations to select the “best and the brightest” executives, to give them major attention and lavish rewards, and to get rid of the weaklings. Interestingly, *Enron* (of disrepute and criminal talent), is one of the case companies highlighted in the McKinsey study because of its good talent management ...

As is often the case with simplistic advice, based on shaky ground, it seems that the “War for Talent” concept is backfiring in companies that have implemented the recommended practices and it has been heavily criticized of lately: “...*despite claims in The War for Talent, Topgrading, and numerous other books on hiring the best people, the talent mind-set is rooted in a set of assumptions and empirical evidence that is incomplete, misleading and downright wrong*”²⁰.

There is no need for an update to include Talent Management specifically. The concept is possibly on its way out anyway, migrating into already existing HRM practices.

UPDATES MADE IN THE BUSINESS SIMULATION

- To enable closer fit with the growing diversity of KIFs, Celemi Tango now includes an optional package of people cards with salary as first criterion.
- *Best fit* is introduced as new selection criterion for People.

KNOWLEDGE INTENSIVE FIRM THEORY AND NEW CELEMI TANGO

TERMINOLOGY HAS CHANGED considerably since Celemi Tango was launched. Knowledge companies have become **knowledge intensive firms** (KIFs) and **knowledge workers**²¹ have replaced professionals and experts. The basic concepts have not changed much, however, since Peter Drucker 1988 prediction: *The center of gravity in employment is moving fast from manual and clerical workers to knowledge workers, who resist the command-control model that business took from the military 100 years ago. Above all information technology [ICT] demands the shift.* His forecast has come true, except that the command-control model is still alive. It has merely changed form; managers in large KIFs apply more subtle control methods²².

Starbuck's view from 1992 also stands: *A knowledge intensive firm is an organization that can produce exceptionally good results through the help of outstanding expertise*²³. However, since Knowledge Intensive Services these days comprise more than 40% of employment²⁴ in some EU countries (Sweden leads with 47%), distinctions have become necessary and research has been descriptive rather than conceptual. Some findings:

- KIFs are among the most rapidly growing sectors in the EU (Miles 2008), clustering particularly in cities (Wood 2002).
- Innovations in KIFs rely on strong rather than weak ties with customers. (Amara & al. 2008).
- Education and Health (public sector) and Business + financial services (private sector) have the highest knowledge intensity measured as proportions of high skilled workers. (Miles 2008).
- Financial services and ICT-related services are the fastest growing segments. This was written by Miles in 2008. Financial services has had turbulent times since then.
- New classifications: more or less knowledge intensive services. (Miles 2008).
- New distinction (P-KIBS)<->(T-KIBS) – see below (Muller & Doloreux 2009).

For Celemi Tango one distinction is of interest: *Professional services* (P-KIBS) versus *Technology-based services* (T-KIBS). P-KIBS firms offer typical consulting services where ICT plays only a support role, whereas ICT constitutes the core of what T-KIBS offer clients.

UPDATES MADE IN THE SIMULATION

“Old” Celemi Tango already simulates P-KIBS closely. The new cards allow the facilitator to make the firms and markets in the simulation behave more like ICT firms and hi-tech industries.

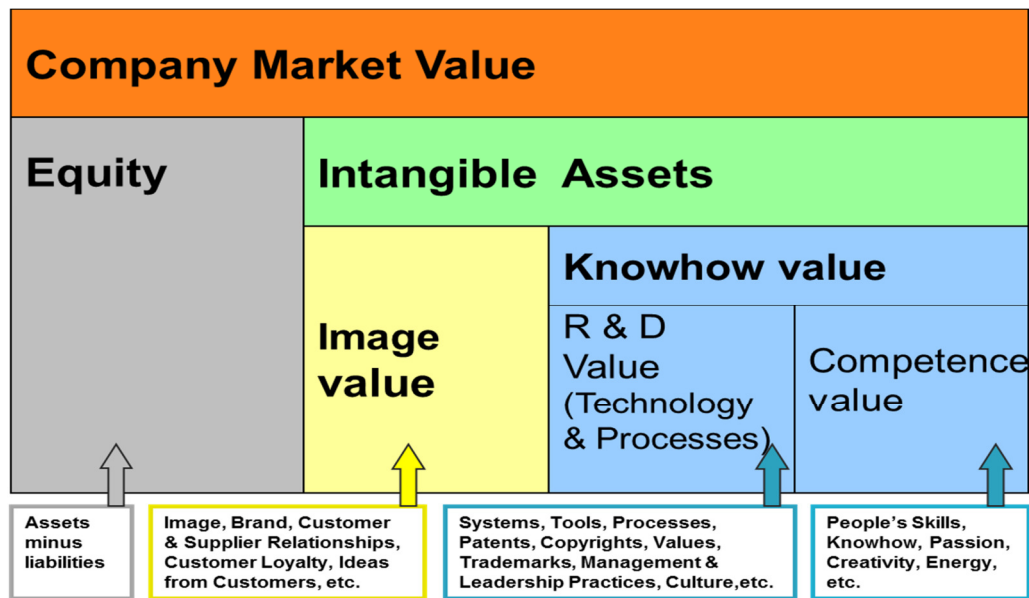
Celemi Tango now includes an optional package of R&D cards which gives teams **the option to invest in two kinds of ICT: Expert Systems, and Process Automation**. The investments increase internal efficiency and reduce people dependence. They also introduce market segmentation. The effects are to improve competitiveness in the market place and to augment knowledge workers' efficiency. These positive effects are partly offset by the need for investment in, and maintenance of the systems.

MEASURING THE VALUE OF INTANGIBLES

HOW DOES ONE MEASURE the economic value of competence, R&D and image, assets that are essentially intangible? We know from experience and theory²⁵ that:

- A professional's *competence* has an economic value for him/her; *salary* and other perks. They tend to grow with experience and position in the hierarchy.
- A firm's *Image* (reputation in the eyes of the customers) has an economic value that can be assessed by brand valuation.
- A firm's *investment in R&D* has an economic value that is captured when patents, copyrights, etc. are sold and bought.

Figure 3. Total Company Market Value and its elements



The whole set of the firm's tangible and intangible assets is valued when firms are bought and sold on the stock market according to Efficient Market theory. However, *company market value* is rarely the same as in its accounts. It is either higher (firms with good brands, unique technology, highly qualified experts), or lower (firms in crisis).

Celemi Tango applies Intellectual Capital Theory, which argues that the difference can be used as an indicator of the economic value of the three intangible assets. Since we don't have a real stock market in the simulation, we measure each one of the assets above in an imaginary currency "M" and further make the simplification that the individual values of the three intangible assets plus the tangible net book value can be aggregated. In this way we simulate total market value of firms, and – crucially for learning – make gains and losses of intangible assets value directly linked to changes in competitive advantage. The price/earnings ratio, for instance, does not give that link.

A new way of measuring stock market value has been discussed in accounting research in recent years: the *Ohlson model*²⁶. It has been shown to fit IC-theory and it is possible to apply. It would, however, require considerable redesign of the core mathematical relationships in the simulation and the side effect would be to obscure causality – thus a loss in terms of learning.

CONCLUSION: The current Celemi Tango model for valuation is sufficiently close to theory. New theory developments should be followed closely, but no need to change model at this stage.

APPENDIX: SERVICES QUALITY THEORY AND CELEMI TANGO CONCEPTS – A COMPARISON

SERVICE QUALITY THEORY ²⁷ ITEMS USED	SIMULATED IN CELEMI TANGO AS: (SP=SERVICE PROVIDER; SIMULATED TEAM)
Assurance <i>(element in Customer perception)</i>	
Handling complaints and claims is reasonable	Chemistry fit: Whole SP team ← → Customer
The Service provider takes responsibility for its promises and actions	
The Service Provider is open and sincere in its communication	
The response to technical inquiries is thorough and prompt	Whole SP team's Competence
Technical problem solving is efficient	
The Service Provider actively suggests ways to improve the performance of the installation	
Reliability <i>(element in Customer perception)</i>	
The behaviour and attitude of engineers is good	Chemistry fit: Whole SP team ← → Customer
The Service Provider gives you satisfactory status reports of ongoing maintenance work	
Service engineers are available when needed	
The Service Bulletins are understandable and useful	Whole SP team's Competence
The quality of maintenance work is good	
The service engineers are competent	
The maintenance reports are correct and useful	
Responsiveness & Empathy <i>(element in Customer perception)</i>	
The Account Manager contacts you often enough	Chemistry fit: SP Team Leader ← → Customer
The Account Manager listens to your opinions and pays attention to your needs	
The Account Manager informs you enough about different products and services	
The Account Manager ensures that your problems and inquiries are taken care of	
The Service Provider understands your business	
Internal Quality <i>(element in SP team member perception)</i>	
Everyone takes responsibility for correcting errors and defects in my working community	SP team's internal Chemistry fit
Everyone takes responsibility for achieving our common goals in my working community	
Teamwork is not evaded in my working community	
My colleagues support and help me when needed	Whole SP team's Competence
My working community produces good quality services/products	
My working community delivers services/products on time	
In our working community we learn from mistakes	

Supervisor (element in SP team member perception)	
My closest superior acts fairly and objectively	SP team's internal Chemistry fit
My closest superior supports and helps me when needed	
How satisfied are you with the communication with your immediate superior about your daily work?	
I can trust what I have agreed with my superior	
My closest superior participates adequately in developing and organizing my everyday work	
I am treated fairly and objectively in my working community	
All employees are treated fairly and objectively in my working community	
Everyone is respected and trusted in my working community	
How satisfied are you with the communication with local Company management about your daily work?	
Work Place Climate (element in SP Account Manager perception)	
In my working community we discuss the work targets and the means to achieve them	SP team's internal Chemistry fit
In my working community we discuss the work tasks together	
In my working community participation in workplace development is encouraged	
What is the atmosphere like in your working community?	
The atmosphere in or working community is encouraging and supportive of new ideas	- SP team's internal Chemistry fit - Competence growth in challenging projects
In my working community suggestions for improvements are implemented	
In my working community feedback and ideas are obtained from clients	
In my working community the more experienced co-workers show/teach their younger colleagues the	
I am encouraged to develop my professional skills	
Personal Engagement: The harnessing of organization members selves to their work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances. ²⁸	
I appreciate my own work	In Celemi Tango the best possible Workplace Climate is reached when the SP team is staffed with higher Competence than required by the Customer and Chemistry fits perfectly internally as well with customer. (= 3“YES”on Clog questions).
My work is meaningful	
I am satisfied with my present job	
I can use my knowledge and skills at work to their full extent	
My competence meets the requirements of my job	
I find pleasure in doing my present job well	
My work offers me possibilities for personal growth and development	
How varied or monotonous is your work?	
Is your work appreciated in your working community?	
Positive deviance:	
Intentional behaviors that depart from the norms of the referent group in honorable ways. ²⁹	Positive deviance is achieved by staffing the SP team with <u>more</u> competence than required by Customer.

ABOUT

Karl-Erik Sveiby

As one of the founders of Knowledge Management, Dr. Karl-Erik Sveiby has studied knowledge-intensive firms since the 1980's. In 1989, he co-developed a concept and an approach for measuring and reporting intangible assets, The Invisible Balance Sheet, which became one of the sources of inspiration for Intellectual Capital.

In his research at Hanken School of Economics in Helsinki, Finland, Professor Sveiby applies a knowledge perspective on issues such as leadership, sustainability, and innovation. His current research interests are collective leadership in knowledge intensive firms and unintended consequences of innovation. He is on the editorial board of five scientific journals, and has published 14 books and some 50 articles. Dr. Sveiby's latest co-edited book, *Challenging the Innovation Paradigm*, was published in 2012.

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Celemi

With more than 25 years of experience in the field of experiential learning, Celemi helps organizations to quickly and efficiently build competence around business and management concepts, communicate key messages, and mobilize people to act in line with corporate strategies and goals, in order to boost performance. Hands on business simulations and custom-made learning solutions help people understand the big picture and see how they as individuals and teams can make a difference – a prerequisite for changed behaviors and visible results on the bottom line.

With millions of participants in over 70 countries, Celemi is a market leader for board-based business simulations. The wide portfolio includes bestsellers like Celemi Apples & Oranges™, Celemi Decision Base™ and Celemi Tango™ - the latter updated in 2013.

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END NOTES

¹ Tücková & Strouhal 2010.

² TQM =Total Quality Management, BPR =Business Process Reengineering

³ B2B services (Business to Business) are generally knowledge intensive and conducted in a long-term business relationship between professional buyers and professional sellers unlike B2C services (Business to Consumer).

⁴ The term "Knowledge Intensive Firm" was coined by Bill Starbuck 1992. It imitates economists' labeling firms as capital-intensive of labour-intensive. He chose the term to emphasize that knowledge has more importance than other inputs. Kärreman (2010) does an update.

⁵ Etzioni 1969, Sveiby & Risling 1986, Alvesson 1989.

⁶ Sveiby 1994, 1997 and 2002.

⁷ Sveiby 1997, 2002.

⁸ See Barney (2001) for an overview of research in the resource-based view in strategy.

⁹ Sveiby & al. 1989, "Konrad group" developed the first ideas towards a comprehensive system for measuring intangible assets, distinguishing: Individual Capital (in Celemi Tango *Competence*), Structural Capital (In Celemi Tango *R&D Value*) and Customer Capital (In Celemi Tango *Image*). The distinction formed the basis of the concept Intellectual Capital, which since 1995 has grown into a considerable research field.

¹⁰ Sveiby 1997, 1998.

¹¹ Mellander 1993.

¹² Figure copied with permission from Fischer 2012. The links in the model are statistically significant, showing positive correlation. Structural Equation Modelling is used to enable a better picture of the path-dependent direction of the correlation than other methods.

¹³ Fischer 2012 p.201.

¹⁴ Fischer 2012 p.201.

¹⁵ No one knows who coined the phrase, "Reputation is Everything", but the term has become even more true due to the social media and the internet. For impact on the people market: see that chapter.

¹⁶ From Polanyi 1962. Expertise is not a property but a relation between individual actors and a social system of rules – a context. A person is an expert within this context: "In a competent mental act the agent does not do as he pleases, but compels himself forcibly to act as he believes he must" p.315. Experiential learning from Mellander (1993).

¹⁷ See Sveiby 1997 for a detailed description. An extract chapter "[Manage Knowledge Workers](#)" is available on line.

¹⁸ Strong brand, reputation for good training, challenging opportunities, social climate. (Hiltrop (1999). MBA students (Ng & al 2012): 1. Challenging work, 2. Learning on the job. China: 1. Remuneration. 2. Career 3. Learning 4. Corporate culture, Han&Froese 2010). India 2012: 1. Challenging tasks, 2. Work internationally, 3. Work-life balance 4. Reach managerial level (Ng & al 2012).

¹⁹ Myers, I Briggs 1995 and Belbin 1980.

²⁰ Critique by Pfeffer, & J., Sutton, R., (2006) and Beechler & Woodward (2009).

²¹ In an HBR article 1988 Peter Drucker elucidated the concept "knowledge worker" he had coined already in the 1950's and it became the preferred term.

²² Kärreman & Alvesson 2004.

²³ Alvesson 2011.

²⁴ Tücková & Strouhal (2010): KIS proportion of employment in 2005, five highest: Sweden 47%, Denmark 44%, UK 40.8%, Finland 39.2%, Netherlands 38.8%.

²⁵ Sveiby 1997.

²⁶ Giner and Iniguez (2006): The original Ohlson model is: Share price = Current net assets + current residual earnings + Value of "other information". Veltri & Silvestri (2011) show that IC-theory can explain what "other information" is and that it correlates with actual stock market behaviour.

²⁷ Source: Wärtsilä's employee (n=2403) and customer (n=1987) surveys 2007 cited by Fischer (2012).

²⁸ Kahn, 1990:694.

²⁹ Spreitzer & Sonenschein, 2003:209.