IMIE

Executive Master Programme

in

Project Management

(PMEX)

Master Theses

Off-print
This publication is an off-print from the PMEX Master Theses series ISSN 1402-1935.

“The Psychology Driving & Barriers to Skunk Work Project”
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THE PSYCHOLOGY DRIVING AND BARRIERS TO SKUNK WORK PROJECTS

Dean Bellefleur
Acknowledgements

The Psychology Driving & Barriers to Skunk Work Projects brings together my own research and other recent work on organizational behaviour, which would not have been possible without the endorsement of Dennis Jönsson at Tetra Pak to whom I extend enormous gratitude. I further wish to thank all the contributors for their time and candidness that is reflected in this paper, namely Paolo Benedetti, Lars Carlsson, Per Gustafsson, Lars-Erik Palm, Roberto Schianchi and Fred Skogli for their vital reflections. To my coach Christian Bergren for his tenacity in focusing my energy in delivering the essence of the research, rest assured “kill-your-darlings” continues to resonate with me. Michael Berg and Karl-Erik Marklund my thesis opponents I sincerely appreciated your efforts in challenging my hypothesis and illustrating the value of clarity that helped me to produce a paper that I hope will be of interest to many. To my family I acknowledge their understanding, endurance and willingness to forgo the best summer southern Sweden has seen since 1860 in my determination to achieve an Executive Masters with Linköpings Universitet.
Executive Summary

The Psychology Driving and Barriers to Skunk Work Projects (referred to throughout this thesis as the paper) represents a study predominantly on Tetra Pak from a selective perspective, the innovators.

Innovators both past & present whose initiatives contribute to the well being of Tetra Pak as well as one from Ericsson were consulted. As with individuals, organizations possess definable characters that are influenced by the various stages of their life cycle. Theories of corporate life cycle phases and organizational character analysis were therefore employed to identify and explain organizational barriers to skunk work leaders & managers.

Predicated on the Organizational Character Index survey developed by William Bridges PhD (himself a recognized leader in the field of transition management) and administered to sixty-one managers within a Tetra Pak business unit established the benchmark. The organizational character was identified and expressed as Myers-Briggs Personality Type ISFP (introverted - sensing - feeling - perceiving).

Benchmark in hand, it was then to ascertain the barriers or resistance that skunk work leaders & managers encounter when promoting new ideas. The diversity of the barriers led to the clustering of nine categories compiled from the skunk leaders personal interviews. The nine categories are assumptions, change, communication, competences, culture shift, human dynamics, management, sponsorship and vision.

In addition the six interviewees assisted in determining that Tetra Pak business unit had reached the end of a Mature & Consolidating phase of its’ organizational life cycle according to Larraine Segil’s definition. The perception however is that Tetra Pak business unit is already in the declining phase, descriptive of a phase in transition. Bearing in mind that this view of Tetra Pak is shared by a select few of highly regarded innovators and does not represent a collective perception of Tetra Pak.

Triangulation of the findings supported the hypothesis (H1). In identifying both the organizational character and stage of its’ life cycle it is possible to diagnose & subsequently engineer an environment for innovation. It was understood that the initiative is to be management supported.

This paper concludes with the realization that the resources & knowledge leading to innovation exist. Further it suggests how to foster a corporate innovative culture by championing an environmental climate for innovation.
Chapter - Descriptions

Chapter 1: Commences with an introduction to Skunk Works by way of reviewing the background as well as selected interpretations of the founder’s definition. The limitations of the thesis are discussed in this chapter as they relate to the thesis: The Psychology Driving & Barriers to Skunk Work Projects.

Chapter 2: Defines the purpose of the paper and touches upon the pragmatism of conducting research on skunk work projects. Questions including the research hypothesis as they pertain to the thesis appear in this chapter.

Chapter 3: Details the methodology prescribed for the thesis that constitutes the collection of both primary & secondary data. A brief introduction of the seven interviewees focusing on their careers as skunk leaders or managers is included. The objectivity & background of the thesis are then reviewed as a prelude in establishing the intent of the study.

Chapter 4: Focuses in detail on the rudiments of the literature survey that are fundamental in establishing the theoretical framework upon which the thesis is grounded. Collaborating statements from the interviewees have been extracted as validating testimonial to the theoretical rudiments presented.

Chapter 5: Presents the results of the empirical study predicated on the Organizational Character Index survey administered to sixty-two managers of a business unit within Tetra Pak.

Chapter 6: Identifies & supports the reported barriers to idea acceptance based on the seven interviews with skunk project leaders & authorities. As well the Corporate Life Cycle phase of the reference business unit within Tetra Pak is presented.

Chapter 7: Formulates the conclusions to be drawn from the investigation into The Psychology Driving & Barriers to Skunk Work Projects.
Chapter 1 Introduction

Background

Immortalized by Clarence L. “Kelly” Johnson, Skunk Works by its’ very name is today a cultural metaphor of epic proportions.

Born in Ishpenning, Michigan 02/27/1910 the son of Swedish immigrants and nicknamed by his classmates “Kelly” for his Swedish stubbornness and Old Sod temper, Clarence L. Johnson is the accredited founder of the Skunk Works.

US patented & copyrighted in 1973 by the Lockheed Advanced Development Company, the term Skunk Works1 is used generically to denote secretive, innovative and protected projects staffed by a small group with technical expertise in the aerospace industry.

Why a metaphor? Consider that Richard Sennett (1980) tells us “a metaphor creates a meaning greater than the sum of its parts, because the parts interact.” Kelly created a recipe for success, the Midas touch that business & industry are striving to replicate. His metaphorical usage of the term Skunk Works welds fantasy with factual associations evoking a semblance of rationality.

The origin of the term stems from Al Capp's 1940's L'il Abner's comic strip depicting an outdoor still called "the skonk works" that produced “Kickapoo joy juice” from old shoes and dead skunks. Thus we have the fantasy, Kickapoo joy juice interacting with a given, distillation technology, culminating in a plausible.

Mats Alvesson best expressed it in Understanding Organizational Culture: (2002) when analyzing metaphors. He cites Brown (1976: 173) and illustrates some of the characteristics of metaphors.

“Metaphors involve what Aristotle called “giving the thing a name that belongs to something else.” If a metaphor is taken literally, it usually appears absurd. The necessary ingredient of difference has a specific cognitive function: “it makes us stop in our tracks and examine it. It offers us a new awareness”. Metaphors are intended to be understood; “they are category errors with a purpose, linguistic madness with a method”. Metaphors must be approached and understood as if they were true at the same time that we are aware that they are fictitious – created and artificial.”

1 Listed in the Random House Dictionary: “Often a secret experimental division, laboratory or project for producing innovative design or products in the computer or aerospace field.”
Rendering Skunk Works to a cultural metaphor disperses the cloud of mystique in order to address the issues of this thesis. Namely, “The Psychology Driving & Barriers to Skunk Work Projects.”

Definitions

“The Skunk Works is a concentration of a few good people solving problems far in advance – and at a fraction of the cost – by applying the simplest, most straightforward methods possible to develop and produce new products.”

C. L. ”Kelly” Johnson (1910 – 1990)

Interpretations and offshoots of Clarence Johnson’s original skunk works definition abound as evidenced by their inclusion in this chapter. Lockheed themselves have refined Clarence Johnson’s definition into a management approach attesting to its’ strength, is also reviewed in this chapter.

For the sake of clarity this paper will be guided by Clarence L. Johnson’s original definition as it is highlighted above.

Today industry has come to view skunk works as small diverse teams of specialized individuals brought together for a one-time project; disbanded when completed as noted by Robert Sobel (1995)

Until the mid-1980’s, the Skunk Works was a forerunner of today’s “virtual companies”. It employed a small crew of full time engineers, pulled people and resources from Lockheed-California when it needed them to realize a major project. Sweetman, Bill (2000)

Skunk works have the unique ability to rapidly connect existing technologies with consumer needs, thereby accelerating the implementation of useful features. Key to success in this innovation process is combining a “creation” phase with a “commercial” phase. Single, Arthur & Spurgeon, William (1996)

“Where small groups in organizations work away by themselves, unknown to the rest of the organization, on problems which are of special interest to them”

Peters, Tom³ (1987)

“A skunk works is a protected and culturally antithetical body for purposes of innovation” defined by Neal Goldsmith⁴,

President of Tribeca Research, Inc.

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² Sourced from www.geocities.com
³ Thriving on Chaos, Macmillan, London
⁴ Extracted from Skunk works, 1990s-style (Gwynne, Peter 1997)
When the driving force comes from a different position than within the normal hierarchy. Also the development of the new products is based on creativity, technology etc. Per Gustafsson (2002)

**Security via Secrecy**

Department of Defence policy necessitated stringent security requirements for the Lockheed Skunk Works projects. As a result, the subsequent reduction in interference from outsiders greatly improved productivity for the skunk leaders. Jay Miller (1995)

Applying Kelly’s 3rd skunk rule [*restrict the number of people affiliated with the project*] effectively reduces bureaucracy, seen as “a generator of unnecessary work that needs to be controlled brutally” by Jay Miller (1995). This rule coupled with the improved productivity gained from secretly running projects has evolved into a method of realizing projects, authorized or not.

A half-century later this unique management approach is no longer exclusive to Lockheed’s skunk leaders but is sporadically sanctioned by companies with a culture of risk-taking. Logic decrees that what does not exist can’t hurt you. Thus a stigmatism normally associated with a failed project is avoidable if on record the project does not exist.

John Whartmore (1999) is concerned that too little emphasis has been placed on the managers or leadership roles in harvesting creativity (working with skunk works). A concentrated effort by management in adopting Lockheed’s skunk management method\(^5\) as experienced by the Ford Motor Company takes Whartmore’s advice to a successful conclusion.

In 1991 & 92 Ford Motor Company successfully set up a skunk works aimed at developing new technologies to be incorporated in their vehicles. Management’s conclusions from this three-year project were reported in Arthur Single and William Spurgeon’s article, *Creating and Commercializing Innovation Inside a Skunk Works* (1996):

- Very creative and innovative free forms could also be managed to goals within time frames.
- Key support and enthusiasm came from success, every accomplishment got publicity and rewards. Morale was high.

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\(^5\) A Skunk Works is organized around a program manager who is given total control of all program aspects in order to control his costs and meet milestones & objectives.
The Ford skunk project successfully strove to replicate the skunk concept evidenced by the advanced 3-year funding, an off-site facility and management support. Autonomy was granted and the goals were defined thus avoiding what Teresa Amabile (1998) sites as the two most common ways executives mismanage freedom downwards. The barriers typically faced by un-supported skunk leaders were never encountered due to the sanctions of management.

The Skunk Works Approach

The Lockheed Skunk Works since its inception in 1943 have refined their approach to Skunk Works management methods that today what was intended for the development of highly advanced aircraft is being applied to a wider variety of programs in industry.

Their unique management approach fosters creativity and initiative and has proven to be a highly effective means for:

- Creating new technology and concepts
- Rapid prototyping of advanced vehicles
- Engineering and manufacturing development of new systems
- Low rate and small quantity production
- Systems upgrades with new technology

Limitations

Prior to delving into the study it is imperative that the reader be acquainted with the limitations as they pertain to the interpretation of the term “Skunk Works”.

WWII, military projects, Palermo, paranoia & spies the common denominator is secrecy. Lockheed’s need was to deliver the XP-80 jet aircraft in time of war with a time line of yesterday! The location was secret as was the project and the team sworn to secrecy, wives not to be informed. For decades after Lockheed referred to their secret development contracts in the aerospace industry as skunk works.

This study will not explore the realm of secrecy as a tangible entity i.e. premise, facility or geographically; owing to R&D facilities, off-site workshops and laboratories are today security equipped or have access to this service. It’s sufficed to conclude that man’s age old preoccupation with concealment will continue and serves no purpose to explore here.
Secrecy as to whom is informed or in the know is today a strategic decision not unlike whom to trust. The pros & cons inequitably the by-product of first hand experience. A secret in itself is a paradox, whom to trust with your secret! Therefore the ethical aspect of secrecy will be excluded from this study as inexhaustible a topic as it is.

The industry sector, technology or development application will not be considered so as not to limit the breath of the investigation into skunk works. Innovation belongs to no single domain.

The human resource aspect will only be investigated as a psychological investigation into motivations, satisfactorius fulfillments, determination and the incompatibility of personalities within organizations. As to what constitutes the appropriate team size or diversity of personalities will be considered a limitation of this paper.

Possessing an awareness of the limitations is the departure point for this thesis. I now invite the readers to examine the approaches set out in the following chapters and to consider the issues broached.
Chapter 2 Purpose

Purpose of the Research
This paper will study the career experiences and frustrations encountered by innovators primarily focusing within, but not exclusive to Tetra Pak. Innovators both past & present that influenced Tetra Pak’s growth as well as one from Ericsson have been consulted. Theories of corporate life cycle phases and organizational character analysis will be used to identify and explain organizational barriers to skunk work leaders & managers in order to secure future growth.

Comprehension to this fundamental organizational issue, namely the sub-optimization of existing creative resources is sought. To this end inspiring leaders to optimize the innovation process.

Pragmatism of the Research Study
Judging from the selected reference material, there is a heightened interest in skunk works and the related intrinsic elements i.e. creativity, motivation, leadership. Factions within industry, not all of who are versed in the skills of releasing creativity, positive to the skunk works approach have been evaluating it. This paper will highlight the importance of managing the integration of Skunk Works management methods into an organization. The subsequent paragraphs reflect various views on the users, purpose and skills required to manage Skunk Works.

Observed by Peter Gwynne (1997) skunk works, typically covert projects of the 1990’s are being initiated by individuals from all levels of the corporate hierarchy. An individual or group of individuals low in the corporate hierarchy identifies a solution path and pursues it without the knowledge or authorization of Management. Conversely Top Management as we have witnessed by Ericsson, Ford, Lockheed, Xerox and others sanction skunk projects as essential strategic tools.

Neither a trend nor a fashion, the skunk works concept is a risk-prone managers sword for delivering a project on time and on budget. The essence of which is captured in the motto “Be quick, be quiet, be on time.” still valid today as when quoted by C.L. Johnson in 1943.

Emphatically, creativity in today’s knowledge economy is a critical success factor for innovation. Teresa Amabile’s (1998) paper on “How to Kill Creativity” sounds the alarm to just how companies are unwittingly employing
managerial practices responsible for crushing intrinsic motivation – the passion & the interests.

John Whartmore (1999) in “Releasing Creativity” observed that a great deal of research exists on what makes individuals & groups creative but little emphasis has been placed on the managers or leadership roles in harvesting creativity. The fact that many people regard creative individuals as “difficult to manage” suggests the required approach is less widely understood.

Peter Drucker (1985) reminds us in “The Discipline of Innovation” that to create a sustainable business, ahead of the pack it must aim from the outset to become the industry standard however modest the innovation. – “If an innovation does not aim at leadership from the beginning, it is unlikely to be innovative enough.” – Kim and Mauborgne (1997) following a five-year study of thirty companies link innovation to total profit. Further they qualify innovation to mean, “value innovation”, representing a quantum leap in perceived value to dominant the market. The effect of this renders competitors irrelevant. Thus the motivation emerges.

Research Hypothesis and Questions
That skunk work project leaders are coveted for their innovative prowess by some and shunned by others; the question lingering on our minds therefore is why for some and not for all organizations? Surely the lure of financial success would outweigh any misgivings in harboring skunk work leaders. The hypothesis therefore proposes that the answer lies in:

H1. In identifying both the organizational character and stage of its’ life cycle it is possible to diagnose & subsequently engineer an environment for innovation.

Ben Rich, a past president of Lockheed’s Advanced Development Projects (ADP) posed the question that must be on the minds of many: ‘Why haven’t hundreds of other companies tried to emulate skunk works?’ He then answers:

1. Don’t understand the concept or its scope & limitations
2. Others are loath to grant the freedom & independence from management control
3. Too much to risk “for any executive turtle to stick his neck out of the shell”

An accredited authority on skunk works, as department head from 1975-91. Ben’s three statements surface within the barriers identified by the interviewed skunk project leaders reviewed in chapter 6.
More importantly should the hypothesis (H1) be proven, are there solutions to employ?

Of late it’s interesting to note the fate\(^1\) that has befallen the Skunk Works legend, “the elimination of the Skunk Works as a separate division of Lockheed Martin”. Bill Sweetman proposes that the Skunk Works ultimately ran out of projects!

\(^1\) Interavia Business & Technology, Mar 2000 “Destruction of the Skunk Works” Sweetman, Bill.
Chapter 3 Methodology

“Methodology is about what methods should be applied in order to produce new knowledge”


The researcher would further expand this statement to include, “whilst resonating with the confidence of validation”.

Methodology

The work breakdown structure identified the Organizational Character Index survey as a critical success factor for this paper. The risk of receiving too few responses, precluding a meaningful result, as a consequence of the summer vacation period was considered. Consequently a mandatory 63% response rate was imposed & due three weeks prior to closing of the survey.

The literature survey concluded in conjunction with the Organizational Character Index survey. During the six-week period that the Organizational Character Index survey was open the face-to-face interviews took place concluding the week prior, permitting transcribing of the hand notes. The analysis & collation of data remained to complete the paper.

Thesis submission date was August 19, 2002.

Data Collection Methods

The methods of choice for the collection of the primary data were: (a) the Organizational Character Index survey (b) personal interviews.

Secondary data is represented by both the literature survey and the Tetra Pak Market Company survey (2001).

Survey Questionnaire

The Organizational Character Index (OCI) survey created by William Bridges PhD (a recognized leader in the field of transition management) does for organizations what the Myers-Briggs Type Indicator™ does for individuals. It identifies personality types with a fair degree of objectivity.

Based on the same four pairs of opposing tendencies (extraversion/introversion – sensing/intuition – thinking/feeling – judging/perceiving) as the Myers-Briggs Type Indicator™ adapted from Carl Jung’s work. The Organizational Character Index was selected to identify the organizational character of Tetra Pak due to the possibilities of cross-
referencing the findings with available Myers-Briggs Type Indicator™ studies and literature.

The survey was forwarded to eighty managers of Tetra Pak business unit, made accessible via Internet link for a period of six weeks. Typically the rate of response to an online survey is approximately 70%. In actuality the response rate from this group of managers was 78%. The same business unit and managerial level completed the Tetra Pak Market Company survey in 2001 as completed the Organizational Character Index survey. Also accessible via Internet link the response rate in 2001 was 73%.

As a survey tool the Organizational Character Index is constructed of thirty-six closed-ended dichotomous questions permitting respondents to register their degree or strength of choice between two opposites. Utilizing a four-point scale, it allows one to go beyond a simple A or B choice. The Organizational Character Index questionnaire is included as Appendix: A.

In 1993, the Wall Street Journal listed Bridges as one of the top ten independent executive development presenters in America in addition to the many publications he has to his credit.

**Interviews**

Personal interviewing on an individual basis was selected for a couple of reasons.

1. This method of data collection offers flexibility and depth to the information forthcoming from the interviewees.

2. Due to the secretive nature of “skunk works” there is a necessity for first-hand information; documents do not necessarily exist.

The open-ended questions allowed the respondents unconstrained freedom in answering. This method of data collection also provided insight as to their views & rationale during the exploratory stage of this thesis for the researcher.

Initially the intention was to tape-record the interviews however as the conversations tended to last for three hours plus, hand notes were found to induce a higher degree of normalcy; the transcribing of these notes however was time consuming.

The interview protocol used in the study follows as Appendix: B.
Interviewee Selection Criteria

All interviewees were selected on the basis that first they qualified as skunk work project leaders or managers currently working with development. Secondly, that knowledge of the skunk project was not wide spread throughout the organization at the time; the element of secrecy was present. Thirdly, that the skunk projects initially constituted or were considered future platforms for growth. Finally, that the individuals are regarded as inventors and or innovators by their peers.

The author/researcher had prior access to most of the interviewees within Tetra Pak due to his network & involvement with development. Those not employed with Tetra Pak were either referred or contacted via his network.

Companies represented by the interviewees are:

- Tetra Pak AB
- Effectus Gruppen AB
- Ericsson AB
- EcoLean Development AB

Introduction of Interviewees

The interviews are as much a source as they are validating the contents of this paper. They provide an opportunistic glimpse into the psyche of skunk work leaders and were originally intended as appendices. The interviews have not been included due to the sensitivity of the contents.

June 17, 2002 Lars-Erik Palm was interviewed at the Eslöv facility providing a first hand opportunity to observe a skunk work environment.

Lars-Erik, inventor and idea generator has 38 years with Tetra Pak and continues to work as a pensioned Senior Adviser with responsibility for the Eslöv workshop. Lars-Erik today focuses on future development, with his own set of “Kelly’s Rules” (eighteen statements supporting innovation) listed as appendix D.

The interview with Lars Carlsson was held on June 17, 2002 in Lund Sweden. Lars an inventor himself held responsibility for Tetra Brik Research & Development in Italy and Sweden during the early 1990’s.

Lars held positions within Tetra Pak for 31 years prior to partnering with Effectus Gruppen; consultants’ specializing in project management, business processes, leadership and management teams, in 1999. The interview delved into the barriers to new ideas when employed with Tetra Pak and his role as
protector to those skunk works during the leadership years of Hans Rausing, until 1992.

The June 24, 2002 interview with Vladimir Ponjavic was held in Lund, Sweden where he holds the position of Manager for Advance Development within Tetra Pak Converting Technologies AB.

Vladimir has and is currently rapid prototyping technologies that will add diversity to the Ambient Carton product portfolio. The ideas generated lead to technologies that today do not exist. Vladimir consulted to Tetra Pak prior to joining in 1988.

The July 11, 2002 interview with Fred Skogli was held at Kista, Sweden. What followed was a comprehensive perspective of skunk work projects focusing on; innovation centres, leadership, corporate life cycles, barriers - from within Ericsson.

Fred Skogli is recognized for championing & the subsequent launch in 1994 of the Application Modularity technology (AM) a new architecture within the AXE\(^1\) system. Notably AM began as a skunk project. Fred also pioneered Ericsson’s Innovation Centre the “free zone” administered under a double leadership\(^2\) program, human resourced from a competence pool and task segmented into virtual companies.

Fred with 25 years of service within Ericsson was initially employed as a software designer in 1977, promoted to a technical group manager by 1983 and since 1986 he has held management positions within R&D. Following the current organizational changes Fred’s responsibility is in Solution Area Management within Business Unit Systems.

Paolo Benedetti was interviewed July 12, 2002 in Modena, Italy. Acknowledged as Tetra Pak Carton Ambient guru for aseptic technology Paolo Benedetti has been with Tetra Pak since 1983. It’s the aseptic technology that safeguards liquid food contained within Tetra Pak Aseptic packaging from deterioration when stored in non-refrigerated or at ambient temperature.

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\(^1\) AXE itself is a digital telephone switch invented in the 70’s that has been a cash cow for Ericsson since its release. The AXE system as a cash cow peaked in 1989 however due to AM by April of 1995 84% of all Swedish telephone subscribers were connected to AXE.

\(^2\) Access NyTeknik’s article titled “Half a job, two bosses” for more details on this subject at http://www.nyteknik.se/pub/ipsart.asp?art_id=13281
The first 10 years of his Tetra Pak career Paolo was employed within R&D. Then for a period of one year (93) following the relocation of Tetra Brik Aseptic to Modena Italy he was advisor to Product Management and for the past eight years has held responsibility for core key technologies. Today Paolo is the technology officer, which includes overseeing Technology Innovation within Tetra Pak Carton Ambient.

The interview with Roberto Schianchi took place July 12, 2002 in Modena Italy. Roberto is the accredited project manager for the V12 engine that placed Ferrari first across the finish line in 1995. As a point of interest Ferrari engine designs are based on either military or aerospace technology. Following a yearlong courtship Roberto Schianchi was headhunted from Ferrari to Tetra Pak Carton Ambient SpA.

During a conversation in 1975, regarding the development of the stealthy airplane Warren Gilmor (an in-house expert on Soviet weapon systems at Lockheed) made the following statement. “If you think racing cars, you think Ferrari. If you think low observables, you must think Skunk Works.” Coincidently we find just this combination in Roberto!

Since joining Tetra Pak January 1995, Roberto’s first project was the high-speed filler for Tetra Brik Aseptic; TBA/21 was launched on the market in 1998.

Of significance is Roberto’s contribution as skunk project leader for Tetra Pak’s “second aseptic filling platform” from 1999 – 2001. The project was nurtured at the Eslöv workshop prior to relocating to the R&D facility in Lund were it is being run today.

The interview with Per Gustafsson was conducted in Helsingborg, Sweden July 17, 2002.

Per Gustafsson; driver, initiator and champion from day one of his professional life is best known for the hydraulic water hammer at Atlas Copco developed for hard rock drilling in 1995. While with Tetra Pak AB for the Tetra Brik Aseptic high-speed filling machine (TBA/22) plus DIMC cap both developed for Tetra Brik Aseptic packages. Per is deemed an adventurer / visionary by his priors of late at Tetra Pak.

2002 Per accepted the Development Mangers position at Ecolean Development AB. Of notable mention is that Hans Rausing sold his interest in Tetra Pak to his brother Gad Rausing in 1992 and subsequently founded Ecolean in 2000. The company is considered a competitor to Tetra Pak.
Researcher’s Background

Reared as a Canadian Armed Forces dependent, the researcher is familiar with military life having lived for 10 years in the UK and France, relocating to Germany when Charles DeGaulle withdrew from NATO in 1967. He is currently completing his executive Masters Degree in Project Management at Linköping University and holds Diploma’s in Marketing Management and Mechanical Technology from the Ryerson Polytechnical Institute of Toronto.

In 1985 a referral while employed at DSMA Atcon Ltd. (Engineers and Advanced Technology Consultants) specializing in the nuclear, aerospace, environmental, transport, and robotic industries lead him to Tetra Pak, Canada. Today with 17 years within Tetra Pak, the past 11 years as an expatriate, his primary focus has been on new business development & marketing research, followed by project management and product development. His current responsibility is manager of the current processes & product portfolio within Tetra Pak Converting Technologies AB.

Drawing on his expatriate experience from Asia, Europe and North America that accounts for 21 years including business development activities provides for a rounded, entrepreneurial perspective when looking to the future.

The researcher is ENTP extreme, according to Myers-Briggs Type Indicator™ in the IPUlProfilanalys™ his natural self reflects a “persuading conductor”.

Objectivity

Foremost, the researcher in the context of maintaining objectivity voices his strong interest and satisfaction in researching skunk works in order to assure the reader of the integrity of this paper.

Evident from the researchers life experiences, educational - background and general interests he aspires to & works with research and development. The discipline to remain at arms distance and of recording the facts as they were presented without prompting the interviewees for selected responses assuredly was maintained.

This report does not represent a common view on Tetra Pak by nature of the individual’s interviewed. The objective is to analyse Tetra Pak from the perspective of innovators and skunk work leaders and present their views on the current situation and their concerns to the acceptance of new ideas leading to innovation.
The empirical finding that identifies the organizational character of a single business unit within Tetra Pak however represents a more collective and diverse perception of a specific business area.

**Literature Survey**

So copious are the books, articles, abstracts and reports referenced in the preparation of this thesis that it necessitated the confiscating of the family dining room table in order to have the material within hands reach.

Due to the relevance and significant influence the following authors material contributed to the advancement of this paper they have been included in this chapter.

Galvanized within the realm of skunk projects are intrinsic elements of creativity, innovation, leadership, and project management to mention but a few. In order to recognize the barriers to skunk projects there was a necessity for the researcher to explore the dynamics of creativity and human dynamics as well. “Releasing Creativity” by John Whatmore: (1999), the Harvard Business Review on “Breakthrough Thinking” (1999) as well as the work by Mihaly Csikszentmihalyi in “Creativity” (1996) were instrumental in providing much insight.

As mentioned in the introduction, skunk works has enjoyed popularity of legendary proportions, notably in the aerospace & military sectors. Driven by an adolescent's infatuation there is no shortage of reading material, printed or electronic. Ben R. Rich who headed the Skunk Works from 1975 to 91 leads the reader through his personal memoirs of this period in “Skunk Works” (1994).

In attempting to understand and consequently map a corporate organization in terms of its character, William Bridges publication titled “The Character of Organizations” (2000) was instrumental in setting the framework and substance to accomplish this.

“Type Talk” by Otto Kroeger and Janet M. Thuesen: (1988) not only provides the psychological insight and detailed descriptions of the 16 Myers-Briggs Type Indicator™ personality types but also delves into “Typewatching” as a process in understanding and accommodating differences. Supportive to this research study was the section pertaining to the workplace.
Larraine Segil in “Intelligent Business Alliances” (1996) explains the Mindshift\(^3\) Method of Personality Diagnostics by which the linking of personality types to the various phases of an organizations corporate life cycle is made possible.

“Creative Destruction”, Richard Foster & Sarah Kaplan (2001) analyzes creativity from a corporate perspective based on a decade of research sponsored by McKinsey & Co. Organizational revitalization through divergent thinking and discontinuity thereby leading innovation for sustainable growth in time with the market window of opportunity captures the spirit of their work.

The remaining reference literature is credited as it appears in the body of this paper. All literary reference material is inventoried in Appendix: C.

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\(^3\) Mindshift is a service mark of Larraine Segil.
Chapter 4 Theoretical Framework

Corporate Resistance
Compatibility of personalities between organizational life cycles and individuals; understand these relationships and hone in on a root cause plaguing skunk project leaders, namely corporate resistance. Defined, corporate resistance represent barriers to new ideas, concepts, processes that fundamentally evoke a change within the organization. Complacency and risk-aversion are typically found in “Mature” organizations leading to a slowing down of decision-making and implementation time. Indicators that characterize this behaviour are the not invented here “NIH” and not manufactured here “NMH” syndromes in the technology fields, Larraine Segil (1996).

The objective of understanding the relationships is to side step what Richard Foster terms “cultural lock-in” and open up the decision-making processes to harness the collective talents of the organization - synchronizing energies. This is not a case of David taking on Goliath but rather about releasing creativity as a sound business practice.

It is imperative that the organizational analyses reach ground zero. Corporate life cycle stages, culture and personality types & characteristics are common reference points by which we can triangulate a bearing in identifying organizational character to arrive at ground zero. Identifying the organizational character should provide an advantageous insight for skunk leaders to proactively alleviate the fears of risk-averse decision makers.

Literature Survey Review

Stages of Corporate Life Cycle
Just as people have a life cycle, organizations progress through their own organizational life cycles [this paper focuses on six distinctive stages diagram A] complete with corresponding shifts in personality types. Notably Larraine Segil (1996) associates preferred complementing managerial personality types with each stage as matchmaker for a varying degree of corporate success.

Diagram: A represents the six stages of corporate life cycle plotting sales over time.
From start-up of the company, through rapid growth as in the Hockeystick phase, to a slowing down of the rapid growth phase in the Professional stage. From stage 4 onwards sales are levelling off until they begin to drop off in the Declining stage. The sixth stage: the Sustaining phase is where a strategy for reversing the aging process of the organization is introduced.

The exodus of talent is acute in the declining stage as Larraine Segil’s research points out. The situation is one of concern since the first to leave are the employees with marketable skills. In parallel those attempting to initiate organizational change are labelled troublemakers and forced out.

**The Character of Organizations**

William Bridges (2000) acknowledges a character overlay, from where an organization is, relative to its’ corporate life cycle. Agreeably the organizational character is invariably changing as per the stages of the corporate life cycle. Benchmarking the character of an organization provides the understanding to achieve sustainable growth through organizational development.

Three influencing characteristics of Organizational Characters observed by William Bridges also surfaced during the interviews with the skunk leaders,

- Most organizations do not have a solid and unified character but rather represent a collage of characters.
- Founders typically personify an organization as they imprint their vision on the organization they create.
- The markets as well as customers influence the character of an organization.
Creativity and Organizations

Presented under the title of Creativity & Organizations was sourced from “Releasing Creativity” John Whatmore (1999). By inclusion in this paper the researcher fully concurs with these statements.

It has been said that necessity is the mother of invention. If so, adversity must be the father: small work groups, working in garages under “Slumlike conditions” have yielded some creative outputs. Lockheed’s skunk works, Walt Disney, Hewlett Packard and Apple were all born in a garage.

Creative individuals require “a context for freedom – a protected vacuum”, in which the leader “holds back the normal pressures, to give a space – a womb”. Here they do things their way, try different approaches and take risks.

Organizations feel threatened or at risk because their values & objectives are invariably different than in creative groups.

Creativity is about; uncertainty, ambiguity and risk and these may contrast with an organizations desired reputation for solid, steady progress.

Creative individuals tend to be: self-motivating, pursue development of their self-interests, their expertise and skills because this is their life. They participate in the development plans of an organization only to the extent that their life journey coincides for a period with that of the organization.

Organizations are seen as disabling creativity when:

- They are not receptive to or users of ideas
- They take little account of individuals’ aims and objectives
- They take little account of personal development
- Their missions and objectives are excessively dominant

Comments regarding the creativity disabler (they are not receptive to or users of ideas) that coincidently the author included in the chapter titled “removing road-blocks” is referred to in this paper as a “barrier” surfaced unprompted & frequently during the course of the interviews.

By the mid 90’s there was no clear direction. The culture was to kill all ideas just as working with new ideas was not appreciated.

Listening, supporting ideas this is what’s lacking today.

If you have ideas to promote where do you go?
Most people working in creative disciplines are very self-motivated and success is seen as its own reward.

Based on John Whitmore’s research the *Rewards* radar chart clearly signals a. Recognition by team members as a significant motivating factor for creative individuals. c.b & d follow respectively. Clearly perks, financial and advancement don’t hold the same level of gratification as recognition.

Further the individual interviews support these views. For instance, regarding satisfaction at the workplace the researcher asked the questions: “Would you say that your satisfaction is intrinsically generated?” and “What generates personal satisfaction for you in the work place and to what degree?”

*Confirmation & feedback on my work fuelled me through the years. It was not the money until towards the end of my career with Tetra Pak.*

*Yes, too frequently I never even received a phone call to say well done! Of course my salary increased however we seldom give that pat on the back and the recognition goes a long way.*

*By far it’s recognition for my achievements. The drive stems from my internal energy. On the flip side no recognition for results upsets me.*
Creative Behaviour

Mihaly Csikszentmihalyi (1996) in “Creativity” brings forward many traits regarding creativity and creative individuals. The findings are based on ninety-one interviews conducted from 1990-95 with creative people (avg. age 71) fourteen of whom hold Nobel Prizes.

A significant observation for this paper is that of the 275 individuals that Mihaly targeted, those that declined ~ one hundred, sited “no spare time” and “totally overworked” with sincerity. The implication in respect to motivation and energy levels is that these people are doers. It also supports strong indications of individualism running hand-in-hand with creativity.

Of particular interest are the following five statements as they explain the ease with which creativity can be nurtured or extinguished.

1. “Each of us is born with two sets of contradictory sets of instructions: one made up of instincts for self-preservation, self-aggrandizement, and saving energy and the other an expansive tendency made up of instincts for exploring, for enjoying novelty and risk – the curiosity that leads to creativity belongs to this latter set.”

2. “If too few opportunities for curiosity are available, if too many obstacles are placed in the way of risk and exploration, the motivation to engage in creative behaviour is easily extinguished.”

3. “In one company after another, as downsizing continues, one hears CEOs report that this is not an age for innovators but for bookkeepers, not a climate for building and risking but for cutting expenses.”

4. Complexity is what differentiates creative personalities, the tendencies to hold contradictory extremes - thought and action that in most people are segregated.

5. Creative persons know both extremes and experience both with equal intensity and without inner conflict. They move from one extreme to the other, as the occasion requires.

Mihaly’s *Ten Dimensions of Complexity* used to distinguish creative individuals provides further insight into creative behaviour and characteristics. So representative are these ten dimensions that a bullet summary has been included as encouragement for exploration. See appendix F on page 47. Testimonial to the clarity of the behaviours is illustrated by the following two extracts:
• Generally creative people are thought to be rebellious and independent
• Most creative people are very passionate about their work, yet they can be extremely objective about it as well

Unanimously attested by all the creative people interviewed by Mihaly - all love what they do! It’s not the hope of achieving fame or making money that drives them, rather it’s the opportunity to do the work they like.

<table>
<thead>
<tr>
<th>Nine elements describing when an experience is enjoyable are:</th>
</tr>
</thead>
<tbody>
<tr>
<td>There are clear goals every step of the way</td>
</tr>
<tr>
<td>There is immediate feedback to one’s actions</td>
</tr>
<tr>
<td>There is a balance between challenges and skills</td>
</tr>
<tr>
<td>Action and awareness are merged</td>
</tr>
<tr>
<td>Distractions are excluded from consciousness</td>
</tr>
<tr>
<td>There is no worry of failure</td>
</tr>
<tr>
<td>Self-consciousness disappears</td>
</tr>
<tr>
<td>The sense of time becomes distorted</td>
</tr>
<tr>
<td>The activity becomes self-satisfying</td>
</tr>
</tbody>
</table>

**Organizational Psychological Preferences**

A comparative analysis based on the administration of the Myers-Briggs Type Indicator™ to the founders and/or cofounders of 143 firms included in the 1987 *Inc.500* list of the fastest-growing private companies in the United States and the comparison of the results with those of an earlier study of 150 founders/CEO’s of successful, yet slower growing firms supported the primary hypothesis that:

*Founders of the growth-oriented firms would report a greater degree of intuitive orientation that favours focusing on future possibilities, as compared to a sensing orientation that favours focusing on present realities.*

The study clearly showed that a significant difference exists between *Inc.500* & small business founder’s preferences according to MBTI® in terms of collecting information (N/S), drawing conclusions (J/P) and decision-making (T/F). The findings have been summarized in table 2.

---

1 A study by Mihaly of people enjoying their work and not rewarded for with money or fame.
The conclusion drawn from the Ginn & Sexton study is that growth oriented founders, *Inc.500*, prefer an intuitive approach and organized approach or consideration of future possibilities when gathering information, and a thinking or planned and organized approach to drawing conclusions. These preferences represent those facets most frequently used in strategic or growth planning. For the skunk leaders the passion to innovate, to be creative are with the growth-oriented firms as evidenced from the Ginn & Sexton study.

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2 A Comparison of the Personality type Dimensions of the 1987 Inc.500 Company Founders/CEO’s with those of Slower-Growth Firms, authored by Charles W Ginn & Donald L Sexton: 1990
**Creative Destruction**

In “Creative Destruction” (2001) we learn from Richard & Sarah that fear was identified at a Fortune 500 Company as the number-one barrier to innovation. Fear to the organization constituted product cannibalization, channel conflict and earning dilutions. To the individual it is often the fear of unrecoverable economic harm done to one’s career.

Pursued further, of the six hundred individuals questioned within this company 56% felt the company tolerated different ways of thinking, 57% then felt failing on a project would set back their careers. A staggering 89% say no, to the company rewarding proportionately for the risks they might take. Thus the low rewards & unrecoverable cost of failure explained why so little real innovation emerged from the corporate ranks.

Presented as bar Chart 1 “Perceived Barriers to Improving Innovativeness” the fear of taking a risk scored highest at 30%. Notability with the exception of a “Lack of Time” all barriers appear in the barrier table in Chapter 6.

**Perceived Barriers to Improving Innovativeness**

![Chart 1](chart1.png)

Note: Multiple open-ended responses possible. Source: McKinsey & Company Client Survey of Fortune 100 Company

**Market Company Satisfaction Survey**

Initiated in 2001, the results from a Tetra Pak Market Company satisfaction survey between a Tetra Pak business unit and fifty-four international Tetra Pak Market Companies produced the wheel graph on page 21. Depicted are

---

the two-target group’s ratings to 17 areas of concern: a) *internal* Tetra Pak business unit management level members as were surveyed for the 2002-Organizational Character Index survey & b) *external* represented by two management members from each Tetra Pak Market Company.

In regards to risk-taking “willing to take calculated risks and set ambitious objectives” was the statement that the Market Companies judged Tetra Pak business unit to be “playing it safe” scoring it at 3.2. The feedback comments supported the ambitious objective setting however the risk-taking was not felt to be evident. For all intent of purpose this satisfies the definition of being risk-adverse.

The effect of “playing it safe” is further substantiated by the low satisfaction ratings for Decision-making at 2.7 and Innovation 2.6. The effect of risk-aversion on decision-making is the killing of ideas thus stifling innovation Edward De Bono (1992). This then impacts on Product Development as reflective of the 2.7 ranking.

An immediate observation is the substantial overlapping between the 58 internal & 111 external managers responses. There appears to be few secrets in the interface between Tetra Pak business unit and the Market Companies; “they seem to know one another very well” was one consultant’s comments.
The complacency evident by the near matching of the two satisfaction rings, (Tetra Pak business unit received the low score they anticipated) places the organization in the Mature & Consolidating phase of its life cycle as defined by Larraine Segil (1996). Substantiated by the aversion to risk, the protectiveness plus the proliferation of middle management.

Further complacency repels change that Peter Drucker (1998) identified as being inherent in the three external sources for corporate innovation, demographic changes, changes in perception and new knowledge. The low satisfaction with innovation is noticeable on the wheel graph.

The top of the mind question “How do you rate your satisfaction with Tetra Pak business unit’s ability to meet Market Company expectations?” scored a 3.0 out of 5 from the Tetra Pak Market Company managers. The Tetra Pak business unit managers using the identical questionnaire rated themselves at 3.2.
Chapter 5 Empirical Study

Reliability of the Empirical Study

Conferring with both Chris Edgelow (coauthor with W. Bridges) & Robert J. Devine (Consulting Psychologists Press consultant) on July 24, 2002 prompted the inclusion of the following paragraph pertaining to the reliability of the Organizational Character Index instrument.

As underscored by William Bridges, himself an Intuitive (INTJ) The Character of Organizations and the Organizational Character Index is without statistical validation. Noted not to negate William’s work but rather to flag awareness to the fact that the Organizational Character Index is considered an “experimental instrument”. The reliability & accuracy therefore will remain questionable pending validated. Regardless this does not preclude the use of the Organizational Character Index but reminds us “to tread lightly, de-emphasize the number crunching and concentrate on encouraging discussion aimed at pinpointing the essence of the organizations character” suggests Robert Devine.

Tabulated Findings

The Organizational Character survey results are first presented in tabularized format in Table: 3 as a comprehensive overview prior to venturing into the analysis.

<table>
<thead>
<tr>
<th>Table 3: N = 62 Surveyed Respondents</th>
<th>Calculation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate Average Score</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>S</td>
</tr>
<tr>
<td>23</td>
<td>21</td>
</tr>
<tr>
<td>Characters Counted as Totals</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>I</td>
</tr>
<tr>
<td>27</td>
<td>35</td>
</tr>
<tr>
<td>Four-letter Typological Code &amp; Count</td>
<td></td>
</tr>
<tr>
<td>ISTJ 2</td>
<td>ISFJ 1</td>
</tr>
<tr>
<td>ISTP 7</td>
<td>ISFP 8</td>
</tr>
<tr>
<td>ESTP 1</td>
<td>ESFP 5</td>
</tr>
<tr>
<td>ESTJ 5</td>
<td>ESFJ 8</td>
</tr>
</tbody>
</table>

1 Note: An INTJ type recognized area for growth: is the development and expression of their Thinking & Intuitive preferences.
Analysis of the Data

By design the mathematical formulation of the Organizational Character Index questionnaire yields a four-letter typological code, reflecting “Organizational Character”. The code parallels the sixteen basic personality types of Carl Jung’s work that subsequently constitutes the base of the Myers-Briggs Type Indicator™ instrument.

The method of identifying / selecting the organizational character from the sixty-two respondents questionnaires was by quantitative count. Thus INFP appeared the most frequent with thirteen (13) counts as reflected in Table 4. However at 21% (13/62) INFP does not represent a significant majority or necessarily a meaningful result. The researchers intuitive curiosity seeks to establish a meaningful relationship with ISFP if possible.

<table>
<thead>
<tr>
<th>Four-letter Typological Code &amp; Count</th>
<th>ISTJ 2</th>
<th>ISFJ 1</th>
<th>INFJ 1</th>
<th>INTJ 1</th>
<th>ISTP 7</th>
<th>ISFP 8</th>
<th>INFP 13</th>
<th>INTP 2</th>
<th>ESTP 1</th>
<th>ESFP 5</th>
<th>ENFP 5</th>
<th>ENTP 1</th>
</tr>
</thead>
</table>
| Counted the frequency that a four-letter typological code appeared from a sample of sixty-two.

Table 4

Therefore running a count on each letter, as they appeared individually in each of the (sixty-two) respondents Organizational Character Index Typological Codes supports an ISFP organizational character with clearly significant percentages of differentiation 57%, 60%, 66%, 68% respectively. Here we also see that the spread between Sensing and Intuitive is significant, 37 (60%) as opposed to 25 (40%) respondents.

<table>
<thead>
<tr>
<th>Characters Counted as Totals</th>
<th>E</th>
<th>I</th>
<th>S</th>
<th>N</th>
<th>T</th>
<th>F</th>
<th>J</th>
<th>P</th>
<th>Counted the frequency that the eight alpha characters appeared</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>27</td>
<td>35</td>
<td>37</td>
<td>25</td>
<td>21</td>
<td>41</td>
<td>20</td>
<td>42</td>
<td></td>
</tr>
</tbody>
</table>

Table 5

In an attempt to draw a more meaningful conclusion from the data a calculation was made based on the aggregate average score from each of the four Typological Code columns. The classification criterion between the dichotomies (four pairs) is predicated on the score: [22 = D1; 23 = D2] typical for all four columns. The resulting ISFP matches that of the letter count calculation in Table: 5.
<table>
<thead>
<tr>
<th>Aggregate Average Score</th>
<th>I</th>
<th>S</th>
<th>F</th>
<th>P</th>
<th>Average from each of the four columns total scores divided by N.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>23</td>
<td>21</td>
<td>24</td>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

Table 6

Note: that in Table: 6 the second position of the Typological Code clearly qualifies as a Sensing organization with a score of twenty-one (21).

5.4 Organizational Character Defined

Introverted – takes cues and draws power from within, is fairly closed
Sensing – concerns itself with actualities, attends to details
Feeling – reaches conclusions on the basis of values and beliefs
Perceiving – likes to keep options open, distrusts too much definition

<table>
<thead>
<tr>
<th>I</th>
<th>S</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
</table>

The Organizational Character of Tetra Pak business unit has been defined as ISFP based on the preceding data analysis and the following reflections.

Scrutinizing the findings of the Organizational Character survey led the researcher to reflect on the reliability of the instrument, the comments from both Chris Edgelow & Robert J.Devine and the task at hand.

Considering that the notable distinction between ISFP and INFP is between Sensing (S) and Intuition (N) – how the organization gathers information, what it pays attention to and how it perceives, a review of the identifying characteristics concluded the process.

Intuitive (N) – concerns itself with possibilities, attends to the big picture

A few incredibly diagnostic statements were extracted from William Bridges book, The Character of Organizations: 2000.

- CEO, John Sculley of Apple Computer “The best way to be ready for the future is to invent it”. This is Intuitive vision.
- The converse is true for Procter & Gamble a Sensing powerhouse, notorious for conducting exhaustive statistical market surveys.

The following are all traits of a Sensing Organization

- Planning & implementing change is done incrementally
- Change is seen as an improvement to what already exists
- Innovation tends to be in the details rather than in the overall design
- Tinker with things at one end and have continuous improvement programs at the other end
• Try to break down large changes into little steps and prefer to break complex situations into their component parts
• Trust experience, the tried-and-true appeals to the organization,
• Status and power usually go to people with experience in the organization
• New hires are socialized into the organization by learning “how we do things here”
• Skill and competences are defined in terms of experience, meaning that bodies of similar experienced people are grouped together

ISFP as an Organization
The following description is intended as a comparative reference and as such is extracted as it pertains to an ISFP organization one of William Bridges sixteen types of organizational characters.

Typically an ISFP organization is designed to make it possible for individual performers in some craft, art or profession to do what they do well. Hierarchy and authority in general are at best tolerated for the conditions of freedom that they create, and the result is often little islands of activity surrounded by very loose network of support services. There is a colleagueship that cuts across the rankings.

The culture is individualistic and emphasizes expertise and grace. The ways people interact within the ISFP organization have a pragmatic quality: “What are we doing this for? What do you want out of it? What do I want?” The work has a peculiar quality to it.

The ways an ISFP organization handles change depends on how the performers themselves handle it.

The leadership is minimal, unless it is embodied in a master performer whom all the others admire. This kind of organization depends for its continuity on countless little satisfactory encounters between the practitioners and their publics. There is little concern for formal communication. People may express themselves vocally, but there are seldom the concerted efforts that demand clear communication of intent and response to intent.

All in all, the ISFP organization is a kind of anti-organization. It works best when it is part of some larger organization that can do for it what it cannot do for itself. If it were self-contained, one would not expect it to last very long. Rather, it would be more likely to die and be reborn as some similar organization – probably another ISFP. Some people spend their working lives
going through this death and rebirth cycle with a sequence of ISA organizations.
Chapter 6 Findings and Results

Inventory of Identified Barriers

<table>
<thead>
<tr>
<th>Identified Barriers</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>Lack of communication</td>
</tr>
<tr>
<td>Budget (freedom to act)</td>
</tr>
<tr>
<td>Breaking through the organization</td>
</tr>
<tr>
<td>Innovative approach</td>
</tr>
<tr>
<td>Founder &amp; culture gone</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>Risk-adverse managers with no ideas</td>
</tr>
<tr>
<td>Culture change</td>
</tr>
<tr>
<td>Personal agendas</td>
</tr>
<tr>
<td>Decision maker could not promote the ideas of others</td>
</tr>
<tr>
<td>Assumptions</td>
</tr>
<tr>
<td>Budget</td>
</tr>
<tr>
<td>Management</td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td>Listening, support</td>
</tr>
<tr>
<td>Politicians</td>
</tr>
<tr>
<td>No commercial understanding</td>
</tr>
<tr>
<td>Lack of a future strategy with support</td>
</tr>
<tr>
<td>Lack of Communication</td>
</tr>
<tr>
<td>Risk-averse</td>
</tr>
<tr>
<td>Lack of support</td>
</tr>
<tr>
<td>D</td>
</tr>
<tr>
<td>Organizational product structure – change of</td>
</tr>
<tr>
<td>Lack of involvement</td>
</tr>
<tr>
<td>Groupthink</td>
</tr>
<tr>
<td>Lack of up to date competence</td>
</tr>
<tr>
<td>Negativisms</td>
</tr>
<tr>
<td>Jealousy</td>
</tr>
<tr>
<td>Empire building</td>
</tr>
<tr>
<td>E</td>
</tr>
<tr>
<td>Nobody to speak to</td>
</tr>
<tr>
<td>Technology out of balance</td>
</tr>
<tr>
<td>Management style</td>
</tr>
<tr>
<td>F</td>
</tr>
<tr>
<td>The lack of budget &amp; resources</td>
</tr>
<tr>
<td>No process to collect new ideas</td>
</tr>
<tr>
<td>Not able to recognize a good idea!</td>
</tr>
<tr>
<td>Others within the group – groupthink</td>
</tr>
<tr>
<td>Company politicians</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>History &amp; experience – “we tried it that way!”</td>
</tr>
<tr>
<td>Envy &amp; jealousy</td>
</tr>
<tr>
<td>No policy to reward the high achievers.</td>
</tr>
<tr>
<td>Too many technical ideas &amp; not enough commercial focus</td>
</tr>
<tr>
<td>Negative personalities (the idea killers), comfort levels are too high</td>
</tr>
<tr>
<td>Low performance (no consequence for action) as a result of freedom with no accountability.</td>
</tr>
</tbody>
</table>

The inventory of identified barriers table was compiled from the interview notes when identified as a barrier encountered by the skunk leaders. In section 6.2 these barriers have been clustered under general category headings and appear as a direct quote in italics.

**The Barriers and Interview Extracts**

The barriers are presented in tabulated format under general category headings, commented on by the researcher and supported with statements made by the interviewees in italics & from the literature survey.

- Assumptions
- Change
- Communication
- Competences
- Culture Shift
- Human Dynamics
- Management
- Sponsorship
- Vision

**Assumptions**

Here we see unchallenged assumptions rising as barriers to ideas; contradictions need to be validated lest they subvert new ideas.

“Challenge the assumptions” Hans drilled this into us every time we had a new project. One day Hans came to me wanting to create headspace in TBA. He saw an opportunity for beverages that required shaking. When I took on this project I told him that the pack would be too weak due to the lack of support provided by the product content to support stacking and that transportation
would destroy the package. He wanted to know if I had tested this. Of course not. I was relying on our basic assumption that headspace must be avoided. Okay I did the test to satisfy Hans, well the outcome you know, and there was no damage. I learned to challenge the assumptions from this case forward.

Assumptions are based on experience and narrow down the range of possibilities in our thinking. Edward De Bono: (1992) continues confirming that some assumptions are valuable however he emphasises the benefit of challenging assumptions in arriving at new ideas as an authority & author of “Serious Creativity”. Clearly Hans Rausing is of the same mindset and a champion of this practice as evidenced in the above narrative.

“Another example was with Spiraflo (a tubular heat exchanger) where we knew that the materials accounted for 80% of the total cost the balance was our profit. My task was to bring the price down by thirty percent. How to do this and make money? The assumption was challenged and by reengineering we reduced the bill of material enough to reduce the cost.”

History & experience “we tried it that way”!

Change
Resistance to deviating from an established situation, was recognized as a barrier to new ideas. Edward de Bono (1992) identified laziness as a disinclination to do anything different. There exists a preference for the “quiet life” therefore in anticipation of the inevitable new demands ideas are turned down due to laziness.

Well in the AM project the strongest barrier was the organization product structure itself. Change was deemed drastic/catastrophic to the old guard - the middle managers fought to retain their positions & their power balance. The new architecture that AM represented would alter their positions of dominance.

Competences
Identified as a barrier to new ideas when imbalanced or absent competences within an organization precludes any form of investigation due to the lack of awareness regarding the subject. Or a dominant push in a single direction! Technology and commercial competences have been the two most sited examples from the interviewees.

A balance needs to be maintained: between the existing technologies and future innovations no excesses.
Listening, supporting ideas this is what’s lacking today “most people are politicians” so they are risk-averse they have no understanding of the market needs or demands - they don’t want to lose face in front of their employees.

Too much internal focus it should be just the opposite and complemented with technical competence. Today technology is developing at a faster rate; this is a danger for these managers as they are limited by the scope of their aging competence. TODAY it’s the bean counters/accountants making the decisions; the managers need to speak their language as well.

Years of experience were being threatened by the lack of involvement, no role to play as well as having no competence in the AM technology.

High-level managers are being controlled far too much now; the accountants are driving development on costs without appreciation for technology.

Competence – no technical power or just a fraction of what it was. Technology needs to be in balance.

One important learning was “that we are still too much technically driven” a balance is required. There must be a commercial guy on board! Especially during the idea generation phase.

Too many technical ideas & not enough commercial focus.

Communication

Open communication focused on joint problem solving was a key success factor of the Lockheed Skunk Works. It is readily identified as a barrier not exclusive to skunk protects.

Another barrier is the lack of communication; people are not talking across the organization, Tetra Rex, Tetra Top and R&D are not talking very much to each other. For example when we needed to develop a closure for Tetra Brik there was no or very little contact with Tetra Rex who had previously gone down that path, their learning’s should have been exchanged.

Nobody to speak to! Surely there are relevant competences in the Company, but when are they used by Top Management? If you have ideas to promote where do you go?

Listening, supporting ideas this is what’s lacking today “most people are politicians” so they are risk-averse they have no understanding of the market needs or demands - they don’t want to lose face in front of their employees.
The Psychology Driving & Barriers to Skunk Work Projects

Culture Shifts – As William Bridges draws attention to; founders typically personify an organization as they imprint their vision on the organization they create. “The idea of organizational culture is, therefore, one that raises as many problems as it solves.”

A barrier of some significance as we see in Tetra Pak once Hans Rausing left the company.

“It requires lots of effort to get projects approved since Hans left the company in 1992”; following the sale of his interest to Gad Rausing, his brother.

The overall environment is not the same. The bureaucratic investments such as the purchase of Alfa-Laval have lead to a tardiness that Nick Schreiber wants to turn around reviving the original Tetra Pak culture.

There was a significant & noticeable change within Tetra Pak following the purchase of Alfa-Laval in 91. Those coming from Alfa-Laval were risk-averse further they had no ideas. This was totally opposite to the culture that Hans Rausing fostered within Tetra Pak.

There was always a demand for new ideas that was appreciated by Hans and of course he protected these ideas.

You have to understand that Hans was firing off ideas right & left further he had an insatiable appetite for new technologies. As a result he had projects running that the board never knew about.

Two to three years ago all interest in new ideas was completely stopped, “they just cost.” Five years ago it was a must for Converting Technologies Advance Development to present new ideas twice annually. “Nobody within our company was asking for this the last 3-4 years”.

The culture during these years 97-99 was one of generating new ideas. ” The killing of ideas immersed late in 2000 and is still present; I would term it more of a pruning phase.

Human Dynamics
This category includes statements pertaining to risk-aversion, envy & jealousy, personal agendas and empire building.
Risk-Aversion
Zur Shapira: (1995) having studied risk-taking tendencies of managers observed that risk-prone managers were described as innovative, those who “always try to make changes and improve things”, “transaction oriented” “confident”, “outgoing” “aggressive” by their peers.

- The risk-prone manager makes quick, impulsive decisions and does not choose safe solutions.
- They don’t consult with others before taking an action.

The converse was said to describe risk-averse managers.

- “Sitting forever on decisions”
- “Worried about the approval of others”
- “Never making waves”
- “Content with normal development”

The project we have been discussing has taken me 1½ year to push through; I had a meeting with interested marketing people back in April 2001 from Tetra Pak and never heard from them again.

Those coming from Alfa-Laval were risk-averse further they had no ideas.

Listening, supporting ideas this is what’s lacking today “most people are politicians” so they are risk-averse they have no understanding of the market needs or demands - they don’t want to lose face in front of their employees.

Envy & Jealousy

The decision maker could not promote the ideas of others unless he was involved. Hans actually had to support ReCap for it to survive

Jealously, once in range be prepared to be shoot down.

Empire Building & Personal Agendas

Empire building, the “small popes” are widespread. Each empire is working with their exclusive suppliers unaware of the adjacent empire’s network.

Due to my relationship with Hans, management requested reports from my meetings and conversations with him. I had to kill the contact with Hans on this very point, as I couldn’t commit his words to paper. Personal agendas are a barrier.
Personal agendas - there’s thousands of stories in the market of where good ideas have been killed over personal agendas. Case in point Dupont tires and the evolution of belted tires.

**Management**

The roles & styles of leadership are critical. To innovate successfully, you must hire, work with, and promote people who are unlike you, Leonard & Straus (1997). Managers through their actions determine the fate of innovation. Fostering creativity often requires that managers radically change how they build and interact with work groups, Teresa Amabile (1998).

Too many of Tetra Pak managers are solely interested in maintaining the status quo, they’re group-thinkers and unwilling to jeopardize their positions. Further their managers are not encouraging them to take risks either. It’s clear the change agents are missing; the priority should be to focus on the creative, visionary and entrepreneurial people.

This was not the only project that I’ve protected, there was project Barbra that you are familiar with.

Switch to managers that can release the creativity in individuals. They need to be a sponsor & protector while fending off management. Employ more leaders that understand what leadership is! Understand the concept of brainpower. Management in the past took the attitude that “ideas cost money to the consumer”.

“It feels that management expects me to continue but not officially.”

Each turn is secured by a door opener (what is in vogue with management in this case it was process control, depicted on the left) until I reach my objective. It takes two to three times longer to reach the objective.

Here we trusted the people upfront, they worked with pressure and that was inherent with our strategy, as the product would be transferred to our operations in Italy. I “protected them” our staff had no inclination of the funding problems we had, there were some terrible fights over funding.

Key learning’s here were; trust the people – keep your promises to both management & staff – payout lump sum dollars for exemplary work as we did in the free zone. In Ericsson we utilize the balance scorecard and one measurement requires a greater than 40% score from the employees – happy with upper management! )
The composition of the management team today reflects a management style without a sufficient understanding of technical constraints.

Actually he was my best manager; I learned allot from him, management style & techniques of management plus strategic thinking.

Leadership, pure leadership – where is the visionary leadership, the personal charisma that’s absolutely required to drive the company.

**Sponsorship**

In the form of financial support may not always be over come.

Getting financial backing is critical as is freedom to act.

How did you secure the funding?

By repeatedly convincing the managers of the need and I had their trust.

I overcame these barriers by going as high in the organization as I could for funding; I knew 2-5 of the top players. Thereby bypassing all of those against AM, namely the middle management layer.

I eventually took the mock-up to Hans who began talking about it straight away. Once Han’s interest was evident in “project Barbra” management was onboard.

There was always a demand for new ideas that was appreciated by Hans and of course be protected these ideas. Hans never said no to an idea. Ten years ago they were trying to kill TetraWedge. It took until 94 to launch it. Hans had the idea as a gap stopper to Capri-Sonne.

Another barrier is that Tetra Pak has been split into too many small companies each with their respective troop of gatekeepers, the bean counters. In 94 Tetra Pak Research & Development was a hosted company with no access to financial resources so how did I get around this barrier? When I quoted on development projects I added an extra five percent for R&D skunk activities, the new ideas.
I took over, tested my idea, gathered the test results and then pushed the technology to receptive ears in management and the budget followed.

Find a partner for support “doesn’t matter who it is”

On risk, Edward advocates that organizations need to make “venture” or “entrepreneurial” decisions. How much of the available resources will be allocated to new ventures where the potential reward is high but so is the risk factor?

Vision

There is a lack of a vision or at least of a common vision shared by all functions. There should be a consolidation of the company around a simple vision.

Actually we have a shortage of future ideas in Tetra Pak today, “what do we have to grow up”!

All the real long-term business opportunities need to be taken to R&D. Today within Tetra Pak, our sights are set on 2-3 year time lines but what happens when these projects conclude, where’s the long view of the future
Corporate Life Cycle

The significance of determining the Corporate Life Cycle for this thesis necessitates that only the responses of the interviews affiliated with Tetra Pak AB be included; therefore Fred Skogli’s - Ericsson AB, comments to this question have not been taken into account.

The mapping of the corporate life cycle does not represent a common view of Tetra Pak but is the view of a select few of highly regarded innovators.

Further a distinction needs to be made between Tetra Pak business unit and the parent company Tetra Pak AB since the Organizational Character Index survey was only conducted within Tetra Pak business unit.

The responses as listed below, are split between perching Tetra Pak business unit on the borderline of stage: 4 [Mature & Consolidating] or entering stage: 5 [Declining] as depicted in diagram D. Since Tetra Pak business unit exhibits Mature & Consolidating phase characteristics according to Larraine Segil’s definition the conclusion is that Tetra Pak business unit has reached the end of stage 4.

![Diagram E](image)

*It’s definitely in the declining phase today whereas when I joined. It was entering the Hockeystick stage. Tetra Pak was growing we felt very secure! Prior to the 90’s the focus was on packaging material, customers - there was action, inventions - we were responsive.*

*When I joined it was the Hockeystick phase and I would have to place Tetra Pak in the declining phase today based on your definitions of the corporate lifecycle phases.*
Up to a few years ago I would place Tetra Pak business unit at the Mature & Consolidating 4th phase. Today I see some symptoms of both Declining 5th and Sustaining 6th phases, this I’m quite convinced of. I would say that we are positioned on the borderline between phases 4 & 5/6, the question is which way will we go?

Tetra Pak business unit moved from (1995) stage 2: Hockeystick to 3: Professional in 98 and today we are on the border between stage 4 and 5/6. Tetra Pak worldwide I would place on the borderline of 4: Mature & Consolidating with an inclination to move into 5: Declining today.

Larraine Segil best describes a Mature & Consolidating phase when revenues gradually level off; competition is present as the company completes its penetration of available markets.
Chapter 7 Conclusions

7.1 Organizational Character

The organizational character of Tetra Pak business unit has been identified & expressed as Myers-Briggs type ISFP: an Introverted, Sensing, Feeling, and Perceiving organization.

The significance of the organizational character to Tetra Pak business unit is:

**Introverted** – *where the organization focuses and gets its energy*
- The introversion restricts access to the decision making structure
- The environment fosters Group-think
- It narrows the opportunities for new ideas by focusing inward
- Although homogeneous teams reach “solutions” quicker (Teresa Amabile 1998), with less friction and often report high morale, group-thinkers do little to enhance expertise and creative thinking. “Putting Your Company’s Whole Brain to Work,” to achieve an innovative organization means hiring, working with and promoting people that make you uncomfortable; who are unlike you, Leonard & Straus (1997).

**Sensing** – *how the organization pays attention to the world and takes in information*
- The organization’s capacity for gathering information and making decisions is grounded in the reality of the present
- The need for the sensing organization is to develop its’ tolerance for and appreciation of the Intuitive individual.
- The organization deprives itself of a potent competitive weapon: new ideas and the individual is physically, emotionally and intellectually drained as researched by Teresa Amabile (1998)

**Feeling** – *refers to ways of judging situations and processing information*
- An implicit goal is harmony, a sense of social community, tending to be more supportive and less critical on the human resource side. Meaning that considerations of the heart are taken as seriously as those of the head.
- Perceptions of Feeling types are seen as dwelling on the emotional side and Thinkers are thought to be cold blooded in their respective decision-making processes Kroeger & Thuese (1988). Differences of opinion open the decision-making process to emotion as reviewed by Edward De Bono, which effectively stalemates acceptance of new ideas.

**Perceiving** – *how organizations function when dealing with the outer world*
• Acts as if it is in a constant state of fact-finding and climate assessment.
• Influenced by the Sensing characteristic of gathering information, there is a reluctance to formulize specifications as it is seen to impede the instinctive skills that the experienced person brings to a task.
• There is a need to build in more predictability, definitions and structure to facilitate sustainable successes and foresee avoidable failures.
• This inclination usually spells trouble as decision-making has a low priority if it has not been overlooked all together.

Barriers vs. Innovative Environmental Requirements
A skunk work leader’s innovative environment requires:
1. An organizational culture receptive to future possibilities & new ideas
2. Managerial support and risk-prone sponsorship
3. Distraction & interference filters against, bureaucracy, details etc
4. Freedom to act with maximized responsibility, i.e. quick decision-making
5. Open communication
6. Leading competent small teams
7. Challenging, achievable, clear goals
8. Immediate feedback to actions taken
9. Deadlines while recognizing that delays & setbacks will occur
10. Involvement with both current & new technologies
11. Recognition for achievements, not necessarily financial
12. No personal reprisals for failure

These twelve elements represent an optimal environment for both innovation & for Skunk Work leaders to flourish. The omission or elimination of any one of the twelve elements then becomes a barrier, the severity of which is situation dependent.

Gap Analysis Results
1 - Barriers within Tetra Pak vs. Skunk Work Leaders Innovative Environmental Requirements

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1 The barriers considered are those listed in Chapter 6 that are Tetra Pak specific
The conclusion is that Tetra Pak business unit does not support a skunk works environment with only four of the twelve (1/3) Skunk Work leaders innovative environmental elements present.

The checkmarks confirm the innovative elements present:

- Leading competent small teams
- Deadlines while recognizing that delays & setbacks will occur
- Involvement with both current & new technologies
- No personal reprisals for failure

This conclusion is further supported by the results from the Tetra Pak Market Company Satisfaction Survey, as per page 22. That survey highlighted the concerns Market Companies had with the innovation and decision-making. Falling below the overall satisfaction rating of 3.0 points to a propensity for risk-aversion.

**Corporate Life Cycle**

The mapping of the corporate life cycle does not represent a common view of Tetra Pak but is the view of a select few of highly regarded innovators.

Tetra Pak business unit is ending a Mature & Consolidating phase.

Exhibiting Mature & Consolidating phase characteristics according to Larraine Segil’s definition conflicts with the perception that Tetra Pak business unit has entered the Declining phase. One phase no more distinctive than the other suggests a phase that is in transition.

**Fear**

Edward De Bono: (1992) a decade earlier when discussing applications of creative thinking points to three base emotions instrumental in decision making. Once information & logic have been considered, emotions cast the final vote, namely fear, greed and laziness.

- The fear of risk and blame is the basis for rejecting ideas or feeling unenthusiastic about them.
• Laziness as a disinclination to do anything different. There exists a preference for the “quiet life” therefore in anticipation of the inevitable new demands ideas are turned down due to laziness.

• Greed is seen as a positive driving force, the willingness to grow, to make things happen

• Greed is also another reason to reject ideas. Resources, attention, power or benefits that would otherwise rest with the decision maker would be reason enough to reject an idea if in jeopardy of being reduced or lost.

Fear was briefly touched on as a reminder that it is also a motivating factor for rejecting new ideas. Of the nine perceived barriers to improving innovation from the McKinsey & Company survey on page 20 fear ranks first.

7.5 Targeting Innovation

Administering the KEYS² survey Teresa Amabile noted that creativity-killing practices are seldom the work of lone managers, but rather are systemic and thus so widespread that they are rarely questioned. Taken a step further, six general categories influencing creativity were identified that are adversely affected by managerial practices. They are challenge, freedom, resources, work-group features, supervisory encouragement and organizational support.

These six categories were captured in the Skunk Work leader’s innovative environmental requirements. Concluding that the books have been written the resources & knowledge leading to innovation exists it remains to be managed.

Ben Rich’s closing remarks on skunk works were

“A successful Skunk Works will always demand a strong leader and a work environment dominated by highly motivated employees. Given those two key ingredients, the Skunk Works will endure and remain unrivalled for advancing future technology. “

² “KEYS” is a quantitative survey instrument consisting of 78 questions to assess the level of support for creativity in the workplace.
References and Literature Review


Appendix: A - The Organizational Character Index Survey

Please respond to the questions, as you perceive them be at present.

1. Does the organization pay more attention to the demands of its customers or to what it knows how to do best?
   - Customers: 1, 2
   - What it does best: 3, 4

2. Is the organization better at producing and delivering established products/services or at planning or creating new ones?
   - Producing/delivering: 1, 2
   - Planning/creating: 3, 4

3. Which is more important to the organization: its efficient systems or its dedicated people?
   - Systems: 1, 2
   - People: 3, 4

4. Does the organization spell out the details of its policies and procedures, or does it avoid such detail in the name of letting people work in their own best style?
   - Spell out: 1, 2
   - Avoid too much detail: 3, 4

5. Can employees see the organization’s inner workings fairly clearly, or is decision making invisible to most people – with decisions simply appearing mysteriously?
   - Very open: 1, 2
   - Very hidden: 3, 4

6. Does the leadership base its decisions on detailed information about situations or on general trends and a big picture or concept of what is going on?
   - Detailed information: 1, 2
   - Big picture: 3, 4

7. Does the organization ask of people that they fill their official roles effectively or that they exercise their individual talents fully?
   - Official roles: 1, 2
   - Individual talent: 3, 4

8. Would you say that the organization emphasizes reaching a decision quickly or considering things from every angle, even if it takes quite a while?
   - Decisions: 1, 2
   - Look at every angle: 3, 4

9. Are decisions more often made because of market data or because of internal factors such as the beliefs of the leaders or the capacities of the facilities?
   - Market data: 1, 2
   - Internal factors: 3, 4

10. Does the organization more often steer its course by the actualities of the present situation or by the possibilities it perceives in the future?
    - Actualities: 1, 2
    - Possibilities: 3, 4

11. How are organizational decisions really made – with the head (tempered by humanity) or the heart (balanced by information)?
    - Tempered head: 1, 2
    - Balanced heart: 3, 4

12. If the organization has a fault, is it that it locks into decisions too quickly or that it keeps too many options open for too long?
    - Too quickly: 1, 2
    - Too many options: 3, 4
<table>
<thead>
<tr>
<th>Q.</th>
<th>From the beginning</th>
<th>After the fact</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. Do the organization’s people and component units collaborate naturally and from the beginning of a project or somewhat uncomfortably and after their separate positions have been established?</td>
<td>From the beginning</td>
<td>After the fact</td>
</tr>
<tr>
<td>14. When changes are being discussed, which gets more attention – the step-by-step plan for getting to the destination or the vision of where things are going?</td>
<td>Steps</td>
<td>Vision</td>
</tr>
<tr>
<td>15. Which are taken more seriously in dealing with personnel issues – general principles and standards or individual circumstances and situations?</td>
<td>Principles</td>
<td>Circumstances</td>
</tr>
<tr>
<td>16. Does the organization more often act on the basis of set priorities or because of opportunities it discovers in its external environment?</td>
<td>Priorities</td>
<td>Opportunities</td>
</tr>
<tr>
<td>17. Is it the influence of competitors, regulators and customers or its own sense of its identity and mission that is more likely to dictate the organization’s actions?</td>
<td>Relations</td>
<td>Identity/mission</td>
</tr>
<tr>
<td>18. Is the organization better at producing reliable products and data or at coming up with innovative ideas and designs?</td>
<td>Reliable products</td>
<td>Innovative ideas</td>
</tr>
<tr>
<td>19. At the organization, does communicating mean giving information to or staying in touch with its constituencies?</td>
<td>Giving information</td>
<td>Staying in touch</td>
</tr>
<tr>
<td>20. Does the organization rely on carefully established procedures or on “playing it as it happens”?</td>
<td>Procedures</td>
<td>“As it happens”</td>
</tr>
<tr>
<td>21. Which usually determines the organization’s direction – the external challenges it faces or the internal resources it possesses?</td>
<td>Challenges</td>
<td>Resources</td>
</tr>
<tr>
<td>22. Is the organization’s leadership better described as solid and down-to-earth or as intuitive and visionary?</td>
<td>Down-to-earth</td>
<td>Visionary</td>
</tr>
<tr>
<td>23. Which more accurately describes the way managers are supposed to act – following rational policies or acting sensitively and humanely?</td>
<td>Rational policies</td>
<td>Sensitive and humane</td>
</tr>
<tr>
<td>24. Does the organization more often choose to reach a decision or look for more options?</td>
<td>Decide</td>
<td>Look for more options</td>
</tr>
<tr>
<td>25. Is the organization fairly open to influence by employees, customers, or even the public, or is it a pretty tightly closed system?</td>
<td>Open</td>
<td>Closed</td>
</tr>
<tr>
<td>26. Do the organization’s values emphasize acting practically and reliably or ingeniously</td>
<td>Practically</td>
<td>Ingeniously</td>
</tr>
</tbody>
</table>
and inventively?  
27 When people in the organization talk about “the right thing to do”, are they referring to the logical and rational thing or the humane and sensitive thing?  
<table>
<thead>
<tr>
<th>Logical/ rational</th>
<th>Humane/ sensitive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

28 Which better describes the organization’s style – stick to solid ground or ride the river of change?  
<table>
<thead>
<tr>
<th>Solid ground</th>
<th>River of change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

29 In terms of strategy, is the organization driven by its clients’ needs and its competitors’ actions, or by its functional and professional capabilities?  
<table>
<thead>
<tr>
<th>Clients/ Competitors</th>
<th>Functional/ professional</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

30 When big changes must be made, does the organization prefer to deal with them incrementally (broken down into little steps) or holistically (as one integrated transformational leap)?  
<table>
<thead>
<tr>
<th>Incrementally</th>
<th>Holistically</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

31 Is the organization better described as a structure of task-based positions (where the relationships are secondary) or a system in which relationships are almost as important as tasks?  
<table>
<thead>
<tr>
<th>Task-based</th>
<th>Relationship based</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

32 When projects are being planned, are they usually tightly scheduled on a fixed timetable, or flexibly scheduled on an itinerary that can change with circumstances?  
<table>
<thead>
<tr>
<th>Tightly scheduled</th>
<th>Flexibly scheduled</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

33 Does the organization work well with suppliers, joint venture partners, and professional associations, or does it prefer to go it alone?  
<table>
<thead>
<tr>
<th>Works with others</th>
<th>Goes it alone</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

34 Which better describes the organization – sticking to the tried and true or undertaking bold new ventures?  
<table>
<thead>
<tr>
<th>Tried and true</th>
<th>Bold new ventures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

35 Which better describes the leader(s)’ style – criticism or encouragement?  
<table>
<thead>
<tr>
<th>Criticism</th>
<th>Encouragement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

36 Is the organization more likely to plan ahead, or make it up as it goes along?  
<table>
<thead>
<tr>
<th>Plan ahead</th>
<th>Make it up as it goes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
Appendix B: Interview Protocol

Q1. What would you say facilities the realization of your ideas, inspirations and inventions within your working environment?
   - Can you describe your work place in terms of your line of report, authority and budget?
   - Given total freedom what changes would you make to your environment?

Q2. Reflecting on your career can you attribute your present status to a single action or project?
   - Did you have a mentor?

Q3. What yields personal satisfaction for you in your organization and to what degree? Or would you say that your satisfaction is intrinsically generated?

Q4. In the corporate organization how would you describe your character compared to those with higher managerial status and then with your peers & colleagues?
   - Do you feel that there are others like yourself within the company; do you represent the majority or a minority?
   - When are your opinions and ideas sought and by whom?
   - Can you count the number of colleagues that you exchange ideas with and the frequency, daily, weekly, monthly?

Q5. As the generator of ideas and an inventor can you recall the barriers that have been erected in your path over the course of your life?
   - I’m interesting in hearing just how you have managed to overcome them.

Q6. Of the previous companies that have employed you can you identify and describe the conditions or dissatisfactions that led you to seek alternate employment?
   - Are any of these concerns present in your work place today? If so how do you discount them?
Appendix C: Lars-Erik Palm’s 18 Statements Supporting Innovation

Some advice how to be successful with technical innovations/entrepreneurship/commercialisation

1. Be well aware of the current market needs
2. Meet and listen to our customers
3. Communicate with all concerned Tetra Pak organizations. Get a comprehensive overall view
4. Get an adapted budget and freedom to act
5. Use as much as possible known technology and when necessary, available internal and external expertise
6. Do not be afraid to try unusual solutions
7. Believe in your ideas and have staying power
8. Get an optimal innovation climate, speed up the development by working close to a good workshop
9. Give enough time for reflection & have fun
10. Right coach/leader in every development phase
11. Get competent and motivated personnel, give priority to all-round and practical experience
12. Have confidence in and develop your staff
13. No over-confidence in theories, small practical pre-tests give often the necessary result indications
14. Keep a watch on dangerous preconceived opinions
15. Avoid investigation traps, use your intuition more
16. Do not start time consuming documentation too early
17. Cost controls and consumer researches with feedback
18. Use good reward systems that encourage people

Lund 2002-06-23
Lars-Erik Palm
Senior Adviser
Appendix D: Basic Operating Rules of the Skunk Works

Kelly’s Rules

1. The Skunk Works manager must be delegated practically complete control of his program in all aspects. He should report to a division president or higher.

2. Strong but small project offices must be provided both by the military and industry.

3. The number of people having any connection with the project must be restricted in an almost vicious manner. Use a small number of good people (10 percent to 25 percent compared to the so-called normal systems).

4. A very simple drawing and drawing release system with great flexibility for making changes must be provided.

5. There must be a minimum number of reports required, but important work must be recorded thoroughly.

6. There must be a monthly cost review covering not only what has been spent and committed but also projected costs to the conclusion of the program. Don’t have the books ninety days late and don’t surprise the customer with sudden overruns.

7. The contractor must be delegated and must assume more than normal responsibility to get good vendor bids for subcontract on the project. Commercial bid procedures are very often better than military ones.

8. The inspection system, as currently used by ADP, which has been approved by both the Air Force and the Navy, meets the intent of existing military requirements and should be used on new projects. Push more basic inspection responsibility back to subcontractors and vendors. Don’t duplicate so much inspection.

9. The contractor must be delegated the authority to test his final product in flight. He can and must test it in the initial stages. If he doesn’t, he rapidly loses his competency to design other vehicles.

10. The specifications applying to the hardware must be agreed to in advance of contracting. The ADP practice of having a specification section stating clearly which important military specification items will not knowingly be complied with and reasons therefore is highly recommended.

11. Funding program must be timely so that the contractor doesn’t have to keep running to the bank to support government projects.
12. There must be a mutual trust between the military project organization and the contractor with very close cooperation and liaison on a day-to-day basis. This cuts down misunderstanding and correspondence to an absolute minimum.

13. Access by outsiders to the project and its personnel must be strictly controlled by appropriate security measures.

14. Because only a few people will be used in engineering and most other areas, ways must be provided to reward good performance by pay not based on the number of personnel supervise
Appendix E: Mihaly Csikszentmihalyi’s Ten Dimensions of Complexity

1. Creative individuals have a great deal of physical energy, but they are also often quiet and at rest.

2. Creative individuals tend to be smart, yet also naïve at the same time. What the psychologists call the g factor – meaning a core of general interest – is high among who make important creative contributions.

3. A third paradoxical trait refers to the related combination of playfulness and discipline, or responsibility and irresponsibility. There is no question that a playfully light attitude is typical of creative individuals.

4. Creative individuals alternate between imagination and fantasy at one end, and a rooted sense of reality at the other. Both are needed to break away from the present without losing touch with the past.

5. Creative people seem to harbor opposite tendencies on the continuum between extroversion and introversion. In current psychological research, extroversion and introversion are considered the most stable personality traits that differentiate people from each other and are reliably measured. Creative individuals, on the other hand, seem to express both traits at the same time.

6. Creative individuals are also remarkably humble and proud at the same time.

7. Creative individuals to a certain extent escape the rigid gender role stereotyping. A psychologically androgynous person in effect doubles their repertoire of responses and can interact with the world in terms of a much richer and varied spectrum of opportunities.

8. Generally, creative people are thought to be rebellious and independent. Yet it is impossible to be creative without having first internalized a domain of culture.

9. Most creative persons are very passionate about their work, yet they can be extremely objective about it as well.

10. The openness and sensitivity of creative individuals often exposes them to suffering and pain yet also a great deal of enjoyment.
The IMIE is an alliance of thirteen divisions representing five departments and two faculties at the Linköping University. Its aim is to integrate technology, management, and economics with a focus on change and integration in industrial value chains. Three parallel programmes are run: the Graduate-, the Research-, and the Executive Master Programme in Project Management.

The purpose with the Executive Master Programme (PMEX) is to prepare senior project managers for demanding assignments by learning theoretical basics and the best international practices in project management. PMEX helps managers in large firms, with a multidivisional structure, to discover potentials in the management of major projects. PMEX also offers a vehicle for the “learning organisation” as well as methods for crossing artificial borders and creating new combinations of core competencies.


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