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Learning from Nortel Management of Innovation and creating technology success

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A little about me – a different kind of professor?

- **PhD International strategy**
- **Past Management Area Group Chair and current co-director Performance Management**
- **Consultant to several technology companies (SMEs to fortune 500)**
- **Director for Biofuel and Software company**
- **Century Club**
- **Director, recent study on Nortel**

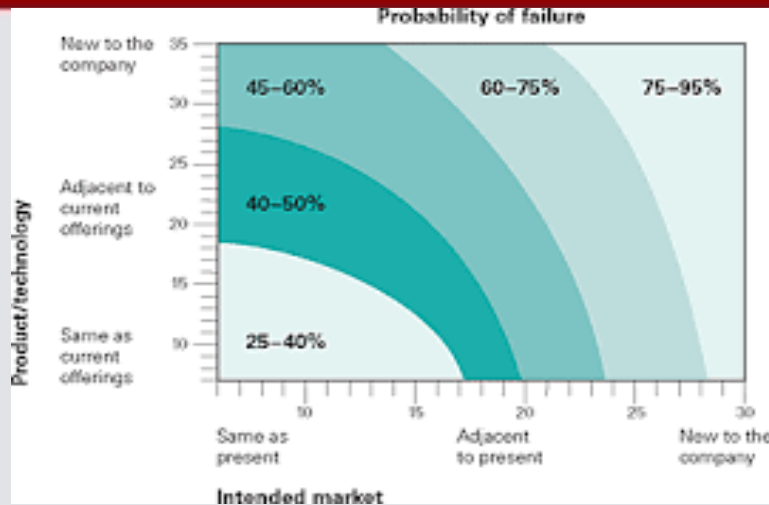
Ask many many questions

- **Apply the readings on the Nortel case study**
- **Tell me what the Russian implications-interpretations - adaptations are to largely North American developed theory**
- **Help you start to create your own model of organizing for innovation**

The objective of innovation

- **“ the purpose of a business is to create and keep a customer” Drucker.**
- **How does this relate to the articles I had you read on innovation?**
- **How does this relate to Nortel?**

What is key in choosing projects – Day Risk Matrix



| Market or Customer \ Technical Solution | Uses our existing product/ operation/ technology | Product/operation/ technology is new to us but exists externally | Product/operation/ technology is totally new to us |
|--|---|---|---|
| Sells into existing market/customer, one we are familiar with | Low Risk Overall | Moderate Risk: Moderate Technical Risk; Low Market Risk | High Risk: High Technical Risk; Low Market Risk |
| Sells into a new market/customer, but one we are familiar with | Moderate Risk: Low Technical Risk; Moderate Market Risk | Moderate-High Risk Overall | Very High Risk: High Technical Risk; Moderate Market Risk |
| Sells into a new and unfamiliar market/customer for us | High Risk: Low Technical Risk; High Market Risk | Very High Risk: Moderate Technical Risk; High Market Risk | Exceptionally High Risk Overall |

What is the key in choosing projects: Day RWW Screen

- **R-W-W- Screen: *Is it real* (does a market exist, is the product real), *can we win* (the product will be competitive, your company will be competitive if), *is it worth doing* (the product will be profitable at an acceptable risk and the product makes strategic sense)**

Phases in the innovation process: Adapted from Frangos

- **Generating ideas (Foresight – long term R&D creating the future)**
- **Moving ideas to reality (Intelligence - R&D towards commercialization)**
- **Adopting ideas by commercializing them (manufacturing, on going intelligence)**

From Kanter and Frangos, how do you create the innovation Day describes

- **Strategy**
- **Process**
- **Structure/organization**
- **Skills**
- **Management/Leadership**
- **Culture**

Additional Materials – management and organizational side of innovation

- **Innovation – The five Dimensions of creating what customers want (SRI)**
- **Ideo Corp. – Recognized as one of the most innovative firms in the world. www.ideo.com**
- **GE Matrix and other tools**

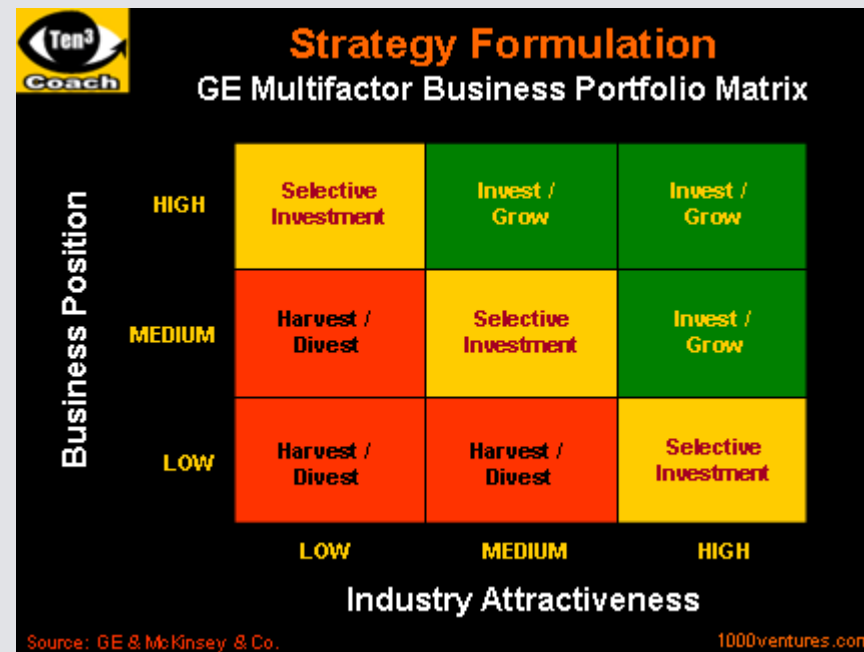
Innovation – Five Dimensions : Creating Value for the Customer

- **Discipline 1: Important Needs**
- **Discipline 2: Value Creation**
- **Discipline 3: Innovation champions**
- **Discipline 4: Innovation teams**
- **Discipline 5: Organizational alignment**

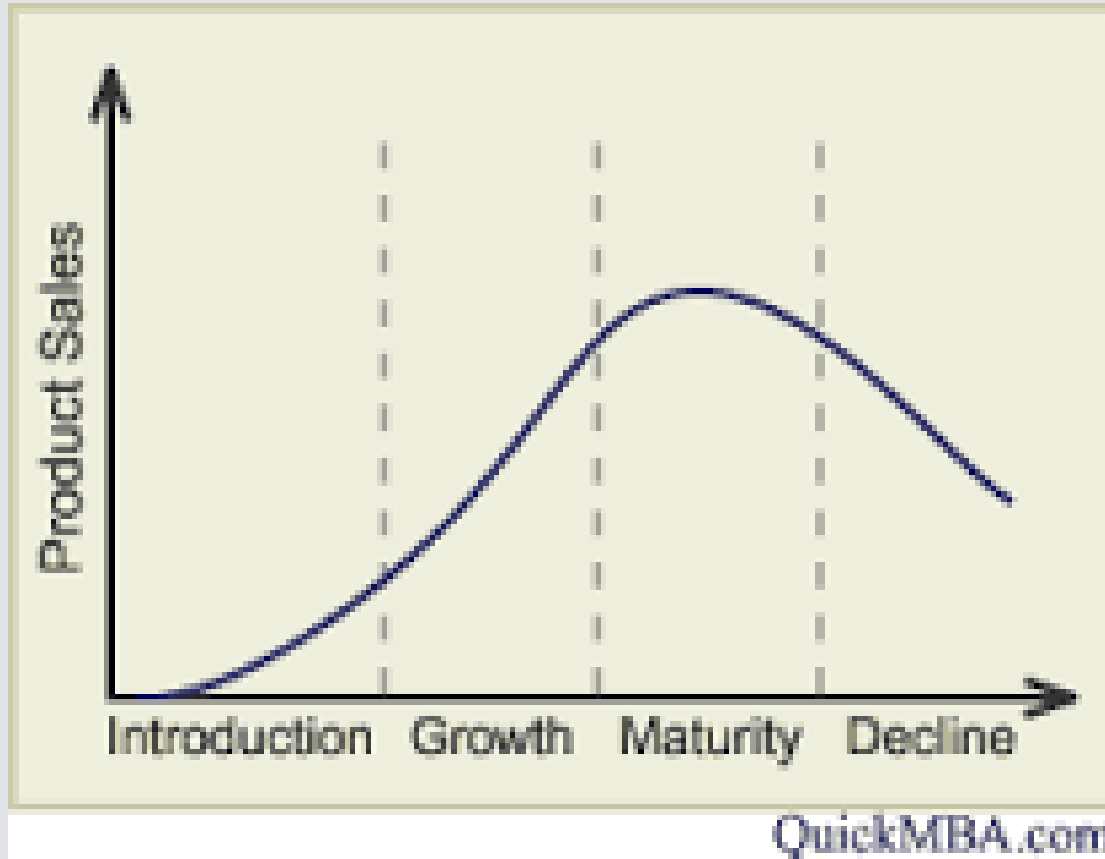
Corporate Moniker for their Innovation Systems

| | |
|------------|---|
| P&G: | Connect and Develop |
| Shell Oil | GameChanger |
| CEMEX | CEMEX Way |
| GE | Imagination Breakthrough |
| Timberland | Invention Factory |
| AGC Russia | InnoLinks/InnoWiz |
| Intel | Exploratory Research |
| Whirlpool | Innovation from Everyone and Everywhere |
| IBM | Emerging Business Opportunity (EBO) Group |

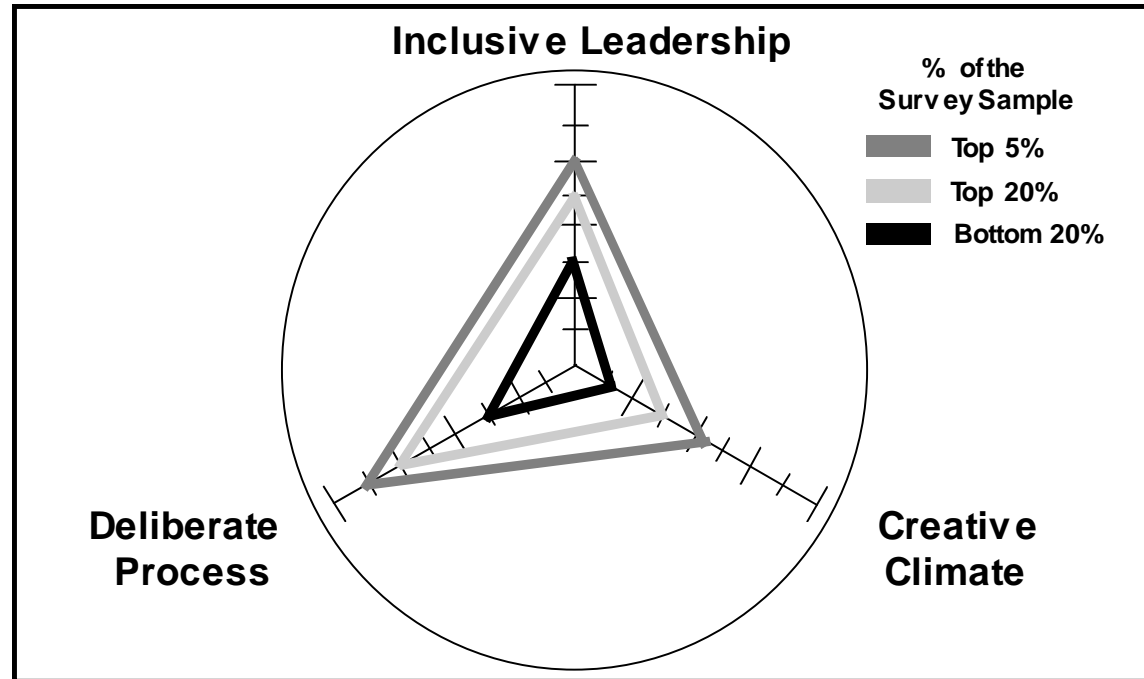
GE Matrix – From McKinsey



Product Life Cycle – From Quick MBA



THE THREE CAPABILITIES



Source: Adapted from Isaksen & Tidd (2006) *Meeting the Innovation Challenge* (Wiley)

External focus:

- **customer focus, *not* customer driven**
- **sensitive to & actively scan for external opportunities**
- **use formal tools e.g forecasting, QFD**
- **design & participate in diverse networks**

Time to apply all of this on Nortel

- **The Nortel study is about complexity, innovation and business. Day, Kantor and Frangas**
- **As I tell you about each phase of the study and each temporal period you do the innovation assessment, ask questions about the R&D**

How was Nortel's R&D? Innovation

The objective of the study

- **Learn why Nortel eventually found itself in this situation. *The objective of the study was to identify lessons learned about corporate failure.* We hope that these lessons learned will help leaders in organizations to identify critical failure factors; and thus, take steps to avoid following the path of Nortel.**
- **Nortel became the biggest and most successful company in Canadian history and then became the biggest failure and bankruptcy in Canadian history as such, the Nortel story is as much about how to develop and sustain success as it is how to avoid failure. This is the big value of the study – just did a corporate retreat on it.**

The Comprehensiveness of the study: 1997–2009

| Method | Total* | Officer/ Senior | Employee | Customer | External |
|----------------------|--------|--------------------|----------|----------|----------|
| Initial survey | 343 | 60 | 265 | 53 | 127 |
| Interviews | 133 | 46 | 45 | 18 | 35 |
| Final survey | 57 | 20 | 18 | 8 | 13 |
| Validation interview | 22 | 11 | 0 | 7 | 6 |

- 48% of all officers interviewed
- Annual reports/10K
- Nortel reports, studies, other secondary
- General email 1997–2009
- Other sources

A script of key events

Confidentiality

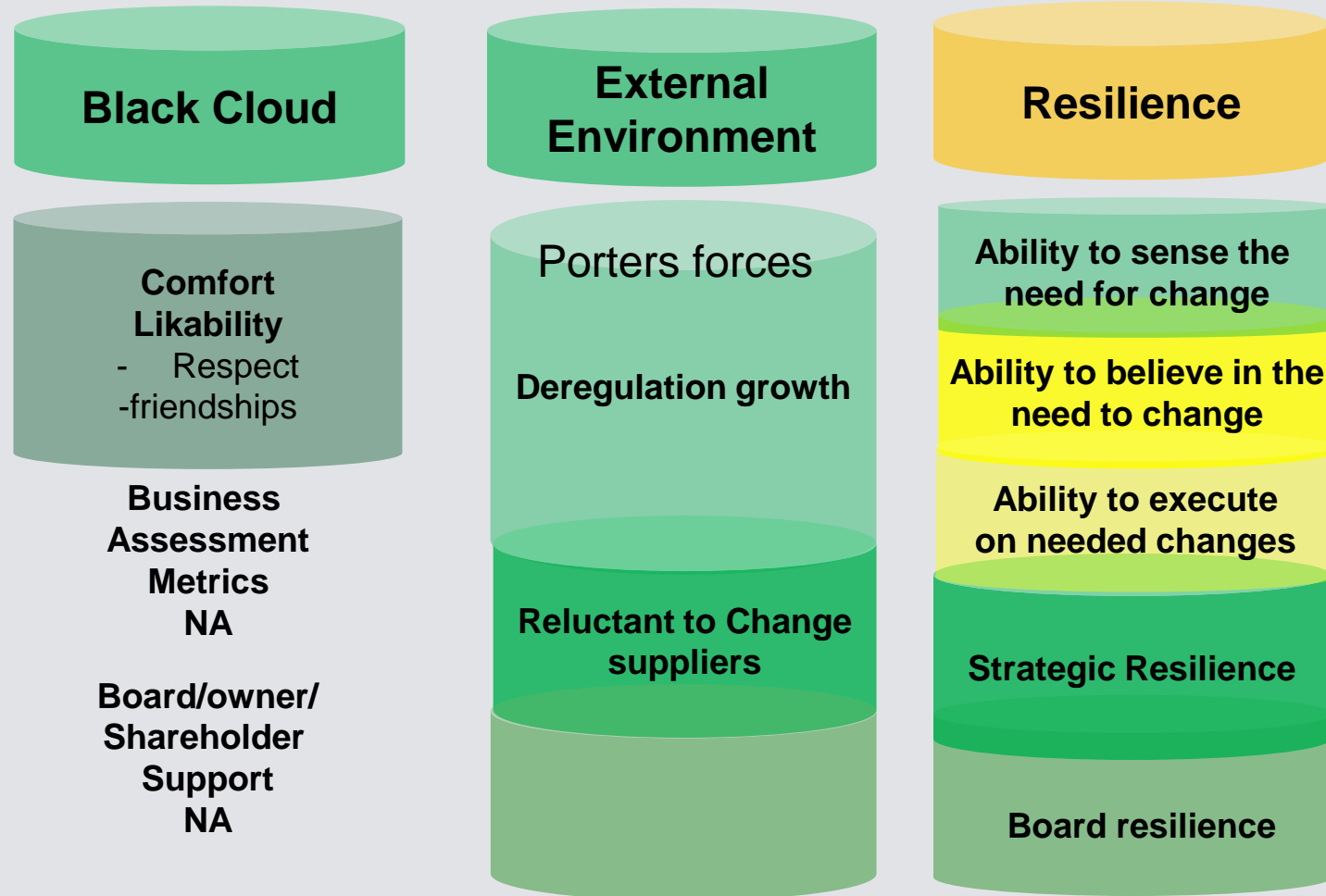
A quick overview of the industry and the company at the studies beginning

- **Teleco**
- **High cost**
- **Source of competitive advantage for customers**
- **High reluctance to switch**
- **Once in “you feed of the trough for years”**
- **“I am betting my career on my supplier”**

“Its not the technical capability today, it’s the strength of the company, it’s the, ‘do we think they're going to be there in 20 years time’? I think that weighed quite heavily with Nortel” (Customer on why Nortel failed to qualify)

Corporate Failure/Success

Model – Nortel Pre 1997



**Nortel created an environment where bright people could make almost anything happen for their customers. Nothing was impossible
But with success comes “attitudes”**

What was resiliency to the research team?

- **The ability to foresee opportunities well in advance and take advantage of the opportunity.**
- **The ability to foresee threats well in advance and either avoid or protect the organization from them.**
- **Nortel needed resiliency for technology changes, market changes, legislative changes, competitor changes, to introduce new products, to identify technology/product opportunities**

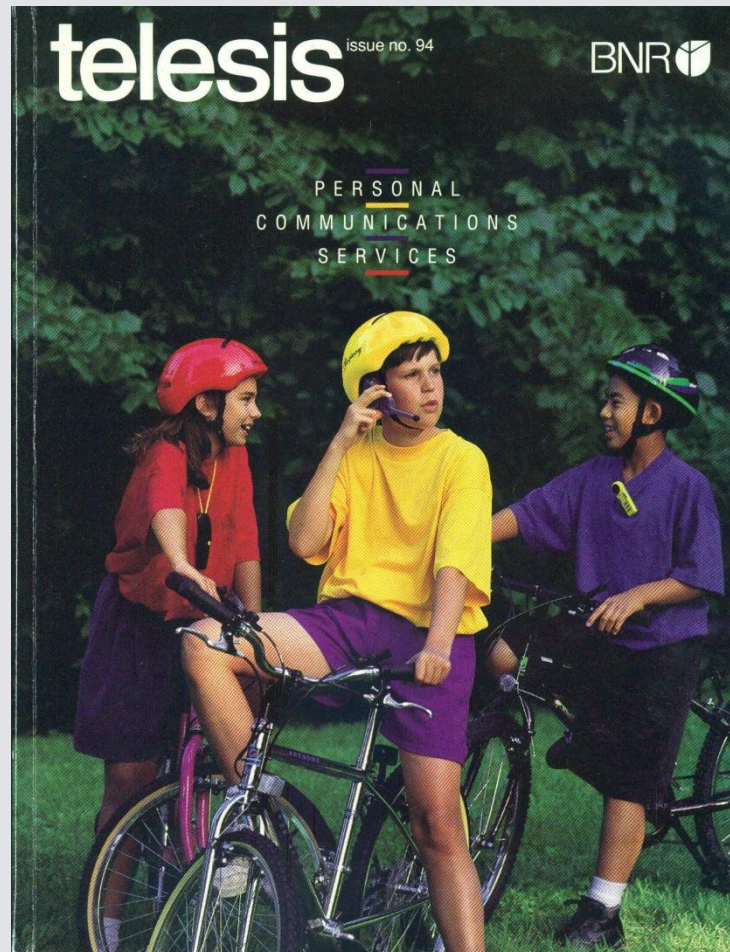
Resilience factors

- **Resilience factors that impact the ability to sense the need for “appropriate” change:**
 - Information/decision-making systems
 - Environmental monitoring systems
 - Appropriate goals on which to focus/strategic focus
 - Adequate time to look for and sense change
 - Senior management cognitive capability
 - Senior management knowledge of the industry
- **Resilience factors that impact the ability to believe in the need for change**
 - Open minded
 - Ability to assimilate outside ideas
 - Lack of arrogance
 - Embracing change
 - Learning culture

- **Resilience factors impacting the ability to execute on changes**
 - Financial discipline and resources
 - Appropriate human resources
 - Ability to direct resources towards fast moving opportunities
 - Good relationships with customers and customer goodwill
- **Strategic resilience factors:**
 - Strategic clarity
 - Appropriate goals
 - Clear focus
 - Past decision resilience
 - Strong value proposition , Strong competitive advantage
 - International strategy and orientation
- **Board resiliency factors**

The Roadmap: Adapted from Frangos

- **Generating ideas (Foresight – long term R&D creating the future) BNR**
- **Moving ideas to reality (Intelligence - R&D towards commercialization) DESIGN AND USE CENTER AND INTELLIGENCE UNIT**
- **Adopting ideas by commercializing them (manufacturing, on going intelligence)**



The Culture From a former Norteler

- **My work day at Nortel (lots of secret hard core projects), 8AM my day would start, lunch and dinner at work work till 10PM go home. Log into conference call at midnight be done at 1 or 2 in the morning and that was my life for 8 years. And I loved it. I could call people at 2 or 3 in the morning and we would meet back at work. Those people are amazing – they even call me know and ask are you interested in doing a real job. There would never be customer call or company call ---we would be there.**

The environment of the 90's

- **Huge growth opportunities (Internet, mobile growth, .com boom)**
- **Customers loyal to Nortel/respect/relationships**
- **Deregulation with Nortel having a “Canadian advantage”**
- **What would you do?**

The story of 1997-2001: Huge growth opportunity .com boom IP

- **Nortel response: Strategy change RAT**
 - Integrated solution wireline+enterprise+wireless+optical,IP
- **Nortel response: Restructure**
 - Divisions for faster customer response
 - Reduce power of “C” suite move it towards divisions for better focus
 - Move BNR into the divisions for better focus
- **Nortel response: Acquisitions**
 - To meet manufacturing and technology requirements
 - To keep out competition
- **Nortel response: System/procedure changes**
 - Various financial and budget initiatives to speed up the process (to meet the speed side of demand)
- **Focus on top line, stock growth, valuation**
 - Acquisitions paid by stock immediate return

- **Massive growth in market cap 1997 23B, 1998 33B 1999 139B at its top in 2000 250B**
- **Massive growth in sales and gross margin: 2000 -\$28B and 45.9% Gross Margin vs \$13B and 40% GM in 1996**
- **# 1 status, largest company in Canadian history**
- **Customers in general pleased**

What is the impact on the following:

- **Generating ideas**
- **Moving ideas to reality**
- **Adopting ideas by commercializing them**

Some background on R&D activities during this period

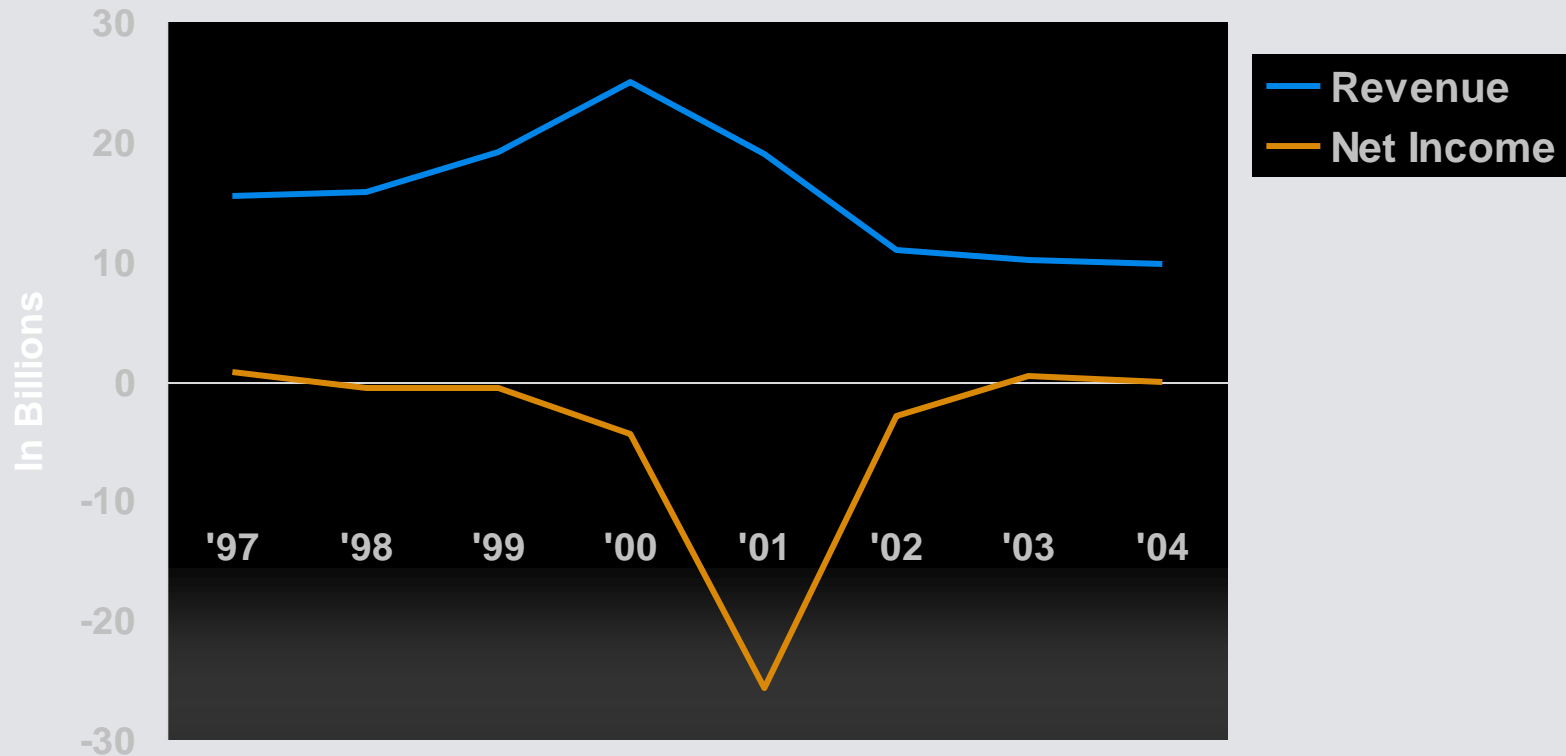
- **What do you think would have been the unintended impact of all these activities on innovation**

The story of 1997-2001: Huge growth opportunity .com boom IP

- **Nortel response: Strategy change RAT**
 - Impact: **Resilience** (strategy and ability to sense the need for change)
- **Nortel response: Restructure**
 - Impact: **Resilience** (ability to execute on changes)
 - **BNR Impact: Resilience** (sense the need for change and strategic resilience)
- **Nortel response: Acquisitions**
 - Impact: **Resilience** (believe in need for change, sense need for change)
- **Nortel response: System/procedure changes**
 - Impact: **Resilience** (sense the need for change)
- **Focus on top line, stock growth, valuation**
 - Impact: **Resilience** (sense need for change, strategic)

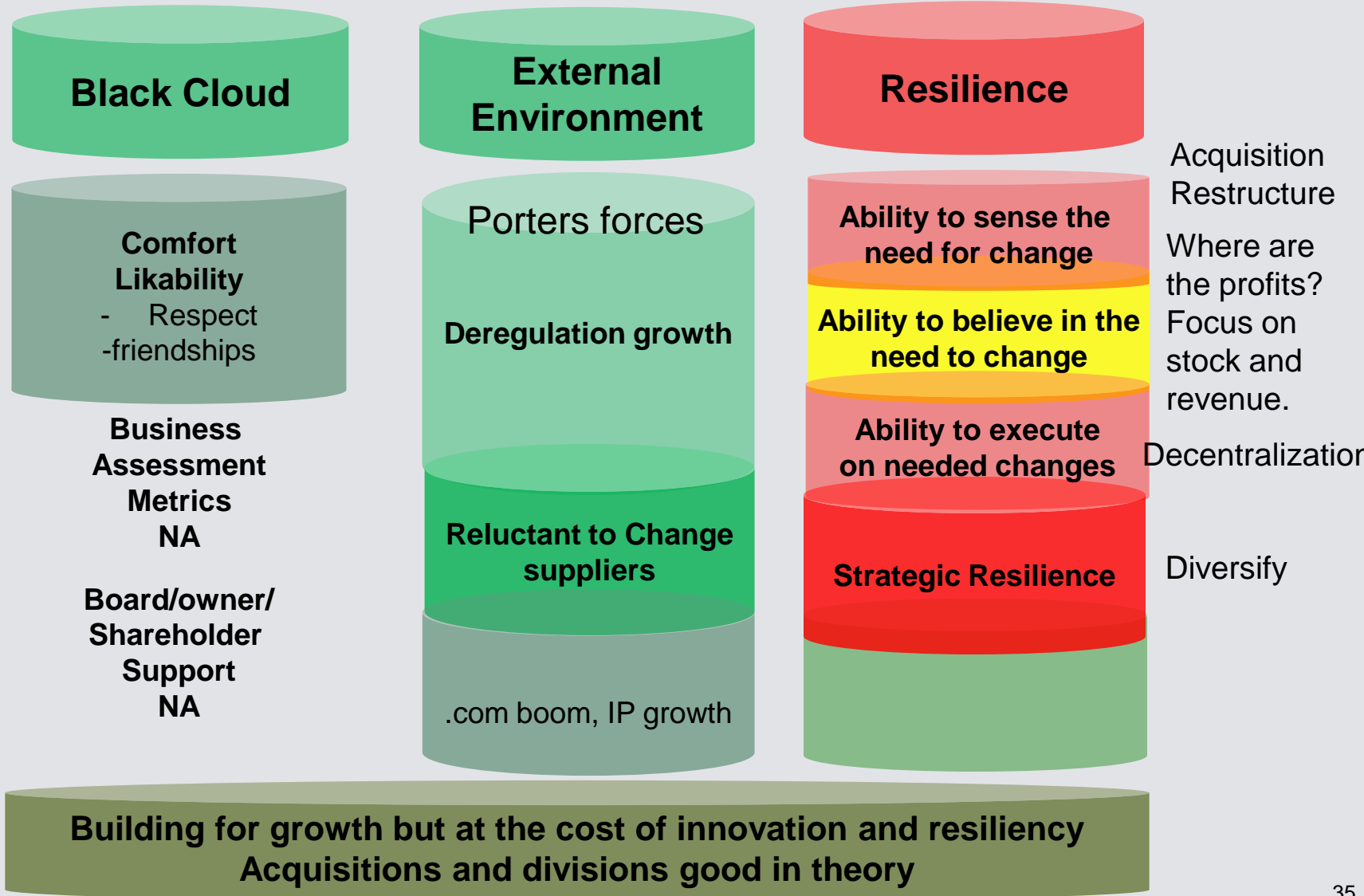
Massive growth and diversification is still difficult to address

Unintended consequences: The Financial picture



Mike Zafirovski 2005 Presentation

Corporate Failure Model – Nortel 1997-2001



- **Increased competition from the far east**
- **Customers flexing their power**
- **Customers push to reduce risk through inter-operability and multiple suppliers**
- **Oversupply, overgrowth, .com bust**
- **Commoditization of Nortel's products**
- **Merger activity**

The environment never really rebounded

| Company | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2000 |
|----------------|---------|---------|---------|---------|--------|--------|---------|
| Nortel | 6,600 | 130 | | | | | 99,259 |
| Ericsson | 37,873 | 24,300 | 29,416 | 37,878 | 32,912 | 32,232 | 90,234 |
| CISCO | 176,716 | 132,180 | 126,576 | 130,461 | 86,797 | 83,125 | 448,356 |
| CIENNA | 4,063 | 869 | 1,061 | 1,271 | 1,284 | 1,249 | 30,122 |
| Alcatel-Lucent | 6,307 | 4,833 | 7,713 | 6,586 | 3,546 | 3,003 | 170,103 |

Do you leave the market? Apple refocused, Nortel contemplated enterprise

Nortel's response **Stick with it**

- **Need a new CEO – Logical the ex CFO it's a financial problem. Roth's gambit.**
- **CEO challenge: Deal with a much smaller market with a high cost model**
 - **Cut staff – 94,500 beginning of 2001 vs 35,160 end of 2003**
- **CEO challenge : Deal with poor moral due to acquisitions and lack of “working together**
 - **Return to profitability bonus**
- **CEO challenge : Poor systems and other issues**
 - **Investment in decision making systems, accounting systems,, visiting/discussions with key customers, settle suits, raise funds, settle lawsuits.**

What is the impact on the following:

- **Generating ideas**
- **Moving ideas to reality**
- **Adopting ideas by commercializing them**

What is the impact of all this on innovation – more background

Unintended impact of these decisions

- **Systems not good (financial especially) but institutional memory, culture, meant that knowledge was there and shared**
 - But what happens to that when the people are fired?
 - Impact: **Resiliency**
- **Cutting staff given realities**
 - How much time do you get to spend in front of the customer, can you provide as much support? Technical front facing? How often do you cut?
 - Impact: **Black Cloud and Resiliency**
- **Customer loyalty, friendships, family**
 - What happens to the relationship when the Norteler is no longer there “face changing monster”
 - Impact: **Black Cloud**

2002-2008 decisions, events and unintended consequences

- **SEC/US Accounting bodies declare a new way to account for revenues all companies need to restate. Nortel also has accounting issues in listing on NYSE.**
 - **Action:** Rather than one big uncertain huge restatement, make a smaller restatement – investigate, learn and restate again. In the end 4+ restatements.
 - **Impact: Black cloud (with culture)**
- **CLO brings to boards attention a potential financial irregularity and concerns from SEC**
 - **Action:** Bring in Wilmer-Cutler a firm with strong ties to the SEC to investigate and clear Nortel.
 - **Impact: Resiliency**
- **Return to profitability bonus concerns (ethic issue) in that it includes non operational, allocation funds (Marconi)**
 - **Action:** Return to profitability bonus now has to be returned.
 - **Impact: Resiliency and black cloud**

- **Wilmer-Cutler report recommends firings of many senior executives**
 - Action: CEO (Dunn) is fired along with other executives
 - Impact: **Black cloud and resiliency**
- **Need for a new CEO due to firing**
 - Board member (Owens) steps up as a temporary measure (ex Admiral)
Eventual hiring of Zafirovski (recommended by CEO's of two major customers, Ex GE, Ex P&G)
 - Impact **Black cloud black cloud Resiliency (see the need for appropriate change)**
- **Actions by all 3 CEO's**
 - Action: Investment in decision making systems, accounting systems, Cutting employment in light of market realities, Maintaining R&D budget, visiting/discussions with key customers, settle suits, raise funds.
 - Impact **resiliency black cloud**

But how does this happen

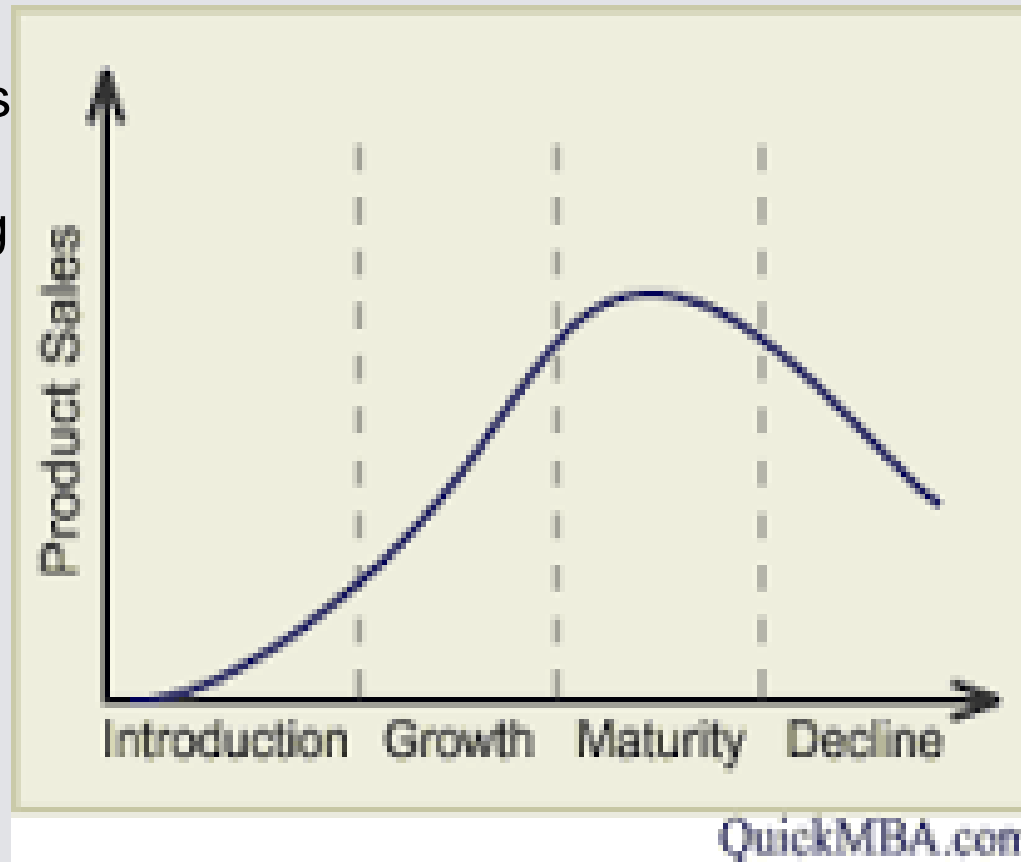
“So lets say you spent circa \$2 Billion a year and had roughly 12,000 people in R&D for the past 5 years – outside of a couple of CDMA customers in North America – how did you get so weak in customer relevance?” (Nortel officer)

- “They were still spending something like \$1.8 billion year in R&D all through that period if not more and so what did they get for \$1.8 billion a year. That's \$18 billion in ten years, what did it produce? I know it doesn't take \$18 billion to bring out the 40-gig system, that's the only announcement I saw.” (Nortel watcher)

Product Life Cycle – From Quick MBA

Where to put R&D Spending

Roese findings
(April 2008):
10% Emerging
35% Current
55% Legacy



Roese
Recommendation
(April 2008):
20% Emerging
60% Current
20% Legacy

Other Roese
initiatives:
R&D Database
Simplified
systems and
system help
Centers of
excellence

Developing A Technology Dashboard

– How bad was it

| Colour | Meaning |
|-------------|--|
| Green | Vastly exceeds customer requirements, creates a competitive advantage for them, use of niche technology approach. Years ahead of competition, a clear advantage. |
| Light Green | Exceeds customer requirements, creates a competitive advantage for them, use of niche technology approach. Ahead of competition, a clear advantage. |
| Yellow | Meets customer current requirements, while reliable no real advantage technologically relative to competitors. As differentiated than competitors |
| Orange | Falling behind customer requirements or competitors products. Decreasing advantage for customers. |
| Red | Does not meet requirements, no advantage for customers, older technology, behind competitors. |

Measures used for the dashboard: Interviews with customers and others, reverse engineering, Delphi, grey literature analysis (poster sessions, web, social networks). 46

Changing Status of Nortel Technology & Product Offerings

| Technology Base | <1996 | 1996-2001 | 2002-2005 | 2005-2009 |
|--|------------|-------------|-----------|-------------|
| New tech.driving sales of new products | Yellow | Yellow | Orange | Red |
| Wireless – CDMA products | Green | Light Green | Orange | Red |
| Enterprise– products | Light Gray | Red | Orange | Light Green |
| Wireline | Yellow | Orange | Red | Red |
| Optical | Green | Light Green | Orange | Yellow |

Product Commercialization Roadmap versus Competitors' Offerings

| Technology Base | <1996 | 1996-2001 | 2002-2005 | 2005-2009 |
|--|-------------|-------------|-------------|-------------|
| Wireline | Green | Light Green | Light Green | Light Green |
| Wireless in general (1G through 4G) | Red | Yellow | Light Green | Green |
| Wireless CDMA (2G & 2.5G) | Red | Yellow | Light Green | Red |
| Enterprise voice (wireline) | Green | Light Green | Yellow | Yellow |
| Enterprise data | Light Green | Light Green | Orange | Red |
| Optical Transmission | Green | Green | Green | Green |

Technology in R&D vs competitors R&D and customer requirements

| Area | <1996 | 1996-2001 | 2002-2005 | 2006-end |
|------------|-------------|-------------|-------------|-------------|
| Wireline | Dark Green | Light Green | Light Green | Light Green |
| Wireless | Light Green | Yellow | Light Green | Light Green |
| Enterprise | Red | Yellow | Light Green | Light Green |
| Optical | Light Green | Dark Green | Dark Green | Dark Green |

Incredible innovation at the end – what does this mean

- **Technology sold for \$4.5 Billion**
- **Divisions sold to many who benefited**
 - Avaya (30/18)
 - Ericsson
- **Employees went on to great things, amazing people and an amazing culture**

What appears to have happened

- **Generating ideas**
- **Moving ideas to reality**
- **Adopting ideas by commercializing them**

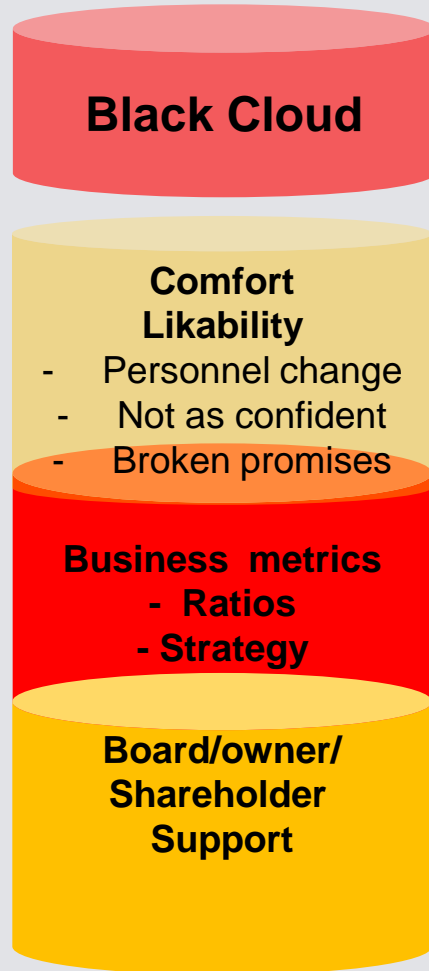
And the Normal Nortel Behavior – legacy of the past

- **Giving/telling the customers what they need**
- **Not offering detailed explanations**
- **I will let you know**

Think of the impact on black cloud of cutting costs, internal focus, layoffs

- No longer doing what they said they would do / broken promises
- Not meeting commitments in terms of sales, R&D, product quality and so forth
- Reduction in customer orientation
- Key technical people that customers trusted leaving Nortel
- Delays in software releases, delays in product delivery
- Escalation in # & frequency of failures and software bugs
- A lack of appropriate communications at the senior level
- Financial statements and other bad news not being properly explained
- Nortel staff who met with customers not acting/behaving in the ways that they had in the past
- Nortel not supporting customers, not acting in the same ways as in the past
- Feeling lied to by the company
- Absence of an 'appropriate' road map showing the commercialization of desired technologies and products

Black Cloud – Some Triggers



2001/2002 Customers are concerned about the industry. Everyone having operational issues

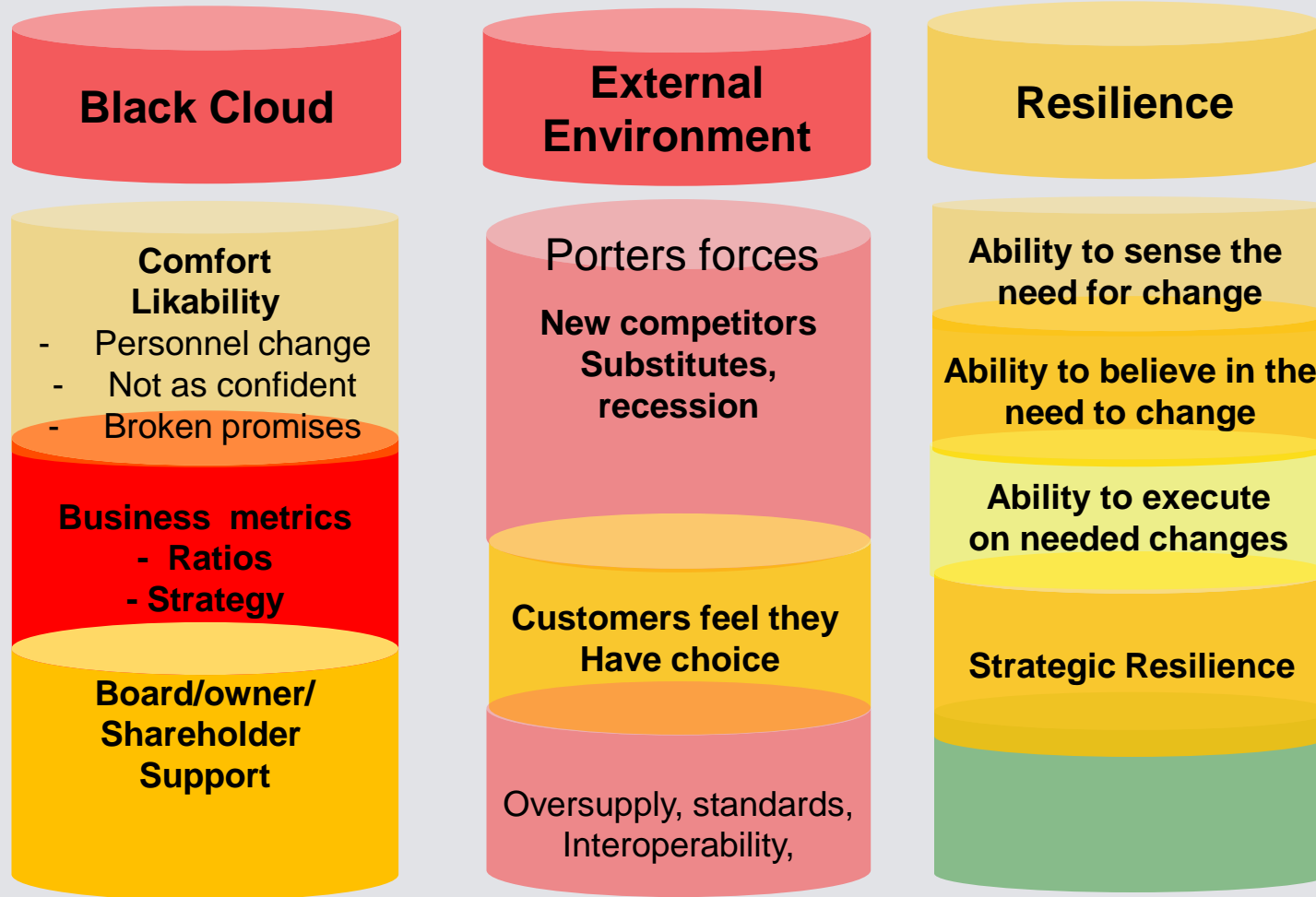
← Customers note change in Nortel behaviors, broken promises get concerned circa 2002/2003 additive

← In depth analysis of management, strategy, financials follows 2003-2006+, historical weaknesses

← Final analysis for some customers finds no referent source of financial or board support. What are they doing?

As customers contract for new technology projects, Nortel despite having technology LTE, is no longer really in the game 2005/2006+

Corporate Failure Model – Nortel 2002-2008



Wilmer-Cutler
Cost cuts
Restate
Internal focus
Cost cuts
Wilmer-Cutler.

Systems Develop but internal focus
Wilmer-Cutler
Systems CTO
Raised cash

**Cut costs improve model is logical in this kind of environment
Building resilience but at the cost of the black cloud**

- **Telco**
- **High cost**
- **Source of competitive advantage for customers**
- **High reluctance to switch**
- **Once in “you feed of the trough for years”**
- **“I am betting my career on my supplier”**
- **Hedge bets with multiple suppliers**

Nortel and Marconi’s “confidence inspiration” opened the door for Huawei to enter the European Telco market

Nortel’s “confidence inspiration” opened the door for Ericsson to make in roads into the United States.

Wireline – ‘Historical Strength’

Context:

- Nortel emerged as a leader in digital switching with its DMS line of products catering to large carrier customers

Strategic issue:

- Over the timeframe of the study period we witness this market maturing

Strategic response:

- Nortel continued to direct most of the investments into mature products, yet failed to provide breakthrough product life cycle extensions

Strategic outcome:

- Competitive advantage in a mature market

Optical – ‘Explosive growth halted’

Context:

- In the early 2000, Nortel is a technology and product leader in optical with OC line of products

Strategic issue:

- An environmental shock disrupts the demand as the dotcom bubble bursts.

Strategic response:

- Nortel re-evaluates the market potential in the optical space and proceeds with downsizing

Strategic outcome:

- Competitive advantage in a declining market

Enterprise – ‘Failed implementation’

Context:

- In the late 1990s, Nortel recognized the importance of the enterprise space, launching the ‘right angle turn’

Strategic issue:

- Nortel is competing with Cisco and feels it needs to scale up fast to respond to the competitive threat

Strategic response:

- Nortel acquires Bay Network, Alteon and other enterprise companies; fails to integrate them; fails to generate new products; overpays for acquisitions

Strategic outcome:

- ‘stuck in the middle’, few product launches yet Avaya will launch 30 products in 18 months from Nortel’s technology. Late competitive advantage never converted.

Wireless – ‘Technology is not enough’

Context:

- As of 1995, Nortel identifies wireless as the key competitive battleground.

Strategic issue:

- The world standard is GSM yet Nortel’s client base is in North America using CDMA.

Strategic response:

- Nortel fails to build strength in 2G, skips over 3G and develops an early lead in 4G (LTE). LTE Customers eventually drop Nortel as they no longer trust the company will survive.

Strategic outcome:

- Technology leadership fails to translate into product leadership. No competitive advantage.

What about in Russia?

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