CHAPTER 2
MANAGEMENT IN FIRMS AND ORGANIZATIONS

Entrepreneurial Energy. Its Creation and Capture. Part III: Strategy for Innovative Business

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Abstract

This paper is the third of the three-part series, "Entrepreneurial Energy. Its Creation and Capture". It uses descriptive economics to demonstrate how an economy and its businesses prosper when government and industry play their appropriate complementary roles.

Section I defines "economic structures for managing strategy" and identifies their role in allowing innovative companies to remain progressive and effective in rapidly changing environments. Sections II and III identify the need to manage strategy in innovative companies such that they achieve flexibility as well as stability, and (with the appendix) show how the "Flexible Stability" structure provides rigor in enabling this.

Section IV illustrates the principles and applications of Flexible Stability through the experiences of Intel Corporation during the mid-1980s, when it shifted its strategy from competing for the DRAM market to developing the microprocessor market.

Key words: entrepreneurship, innovation, strategy, microelectronics.
JEL Classifications: L1, L63, M13, O31

I. Economic Structures for Managing Strategy

Even the most effective strategies often lose their usefulness, especially in innovative businesses that experience rapid change. Accordingly, innovative businesses must manage their strategies very actively. This, in turn, creates additional challenges because strategic shifts can cause problems from gridlock to excessive fluctuation to a demoralized workforce.

"Economic structures for managing strategy" can address these challenges. In contrast to specific strategies, structures that are grounded in solid economics generate perspectives that are (in a limited but useful sense) complete as well as concise, while they do not lose their power even as change occurs in the environment. As a result, they can be used to manage strategy by supporting 1) decision-making, 2) communication and 3) workforce self-management.

In fact, there exist highly influential economic structures for managing strategy, such as Potential Industry Earnings (PIE) and Five Forces, two economic structures that rely heavily upon the supply-and-demand model to provide business leaders with powerful perspectives for the *external* environment. For an innovative business, the question turns to the kind of structure that would help it to continuously refine its strategy by efficiently capturing the dominant realities and economic forces within its *internal* environment.

II. Structure for Managing Strategy in Innovative Business: Flexible Stability

The structure for managing corporate strategy in an innovative company should explicitly account for its internal environment's key targets: *flexibility* and *stability*.

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Targets for Innovative Business Strategy: Flexibility and Stability

Flexibility is especially important for businesses in innovative industries, where change dominates the environment. Andy Grove, chairman and former CEO of Intel sums this up by saying:

> *"Businesses are about creating change for other businesses. Competition is about creating change; technology is about creating change."*[1]

Only businesses that have the flexibility to respond to changes in customers' expectation and alternatives will survive to innovate and prosper.

However, not all flexibility is sustainable; a business needs to be stable. Progress builds over time and is best achieved in stable organizations, as is the credibility increasingly demanded in a highly scrutinizing and interconnected world. A company that does not anchor its flexibility is likely to go out of control that leading it to under-perform or even collapse. The unlimited damage caused by flexibility that is not anchored in stability has been seen more frequently in recent years, including some of the most shocking collapses in business history.

This creates a troubling conflict for those who believe that it is necessary to trade off stability with flexibility, as is often implicit in business strategy approaches. However, the mere idea of this tradeoff is a costly misperception.

The Source of Flexibility

A "stable base" enables flexible performance.

That stability enables flexibility may appear to be a paradox, but "flexible stability" is at the core of countless diverse systems. For example,

- Nature – the stable base of a strong root structure allows a tree to flexibly withstand earthquakes and absorb wind power.
- Society – the stable base of a clear and consistent rule of law enables the flexibility of a free society.
- Sports – the stable base of solid footwork allows an athlete to respond to the opponent with quick, controlled reaction.
- Science – the stable base of first principles and methods allows the scientific community to quantify and reach consensus on highly complex phenomenon (or at least to agree on where they disagree).
- Military – the stable base of an unchallenged hierarchy and intense training enables the flexibility necessary for overcoming the hostile chaos of battle .
- Music – the stable base of musical structure allows jazz musicians to improvise art.

Similarly, an organization built on a stable base can achieve quick but controlled responsiveness to changes in the environment. This raises the question of how a business can establish an economically powerful "stable base".

The Source of Stability

A central principle of economics is that people *purposefully* use their *resources* according to their assessments of *value*. This, combined with the fact that an organization is ultimately a collection of individuals who need to be unified, identifies the following elements of any organization's stable base:

- Core Purpose
- Core Resources
- Core Values

By reflecting the most fundamental economic forces within the organization, this set of features can provide a point of reference capable of stabilizing progress by unifying the efforts and intentions of individuals. It can do in such a way even in a rapidly changing environment in which a formal strategy cannot take into account all possible developments.

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[1] Grove, Andrew S., Only the Paranoid Survive, Doubleday, New York, NY, 1996, p. 20.

Specifically, this set of features can allow employees to respond with unified flexibility to changes because it can provide them with a sense of:

- what is expected of them,
- what boundaries they should not cross,
- what is expected of others and what boundaries they should not cross, and
- that for which they will be rewarded.

In turn, this flexibility allows the stable base elements to be re-applied in new environments in ways that renew their relevance and power. This mutual re-enforcement clears the way for the business to continuously capture entrepreneurial energy and generate progress. Accordingly, the organization's stable base is the starting point for Flexible Stability.

To reveal the intuition behind this three-part stable base, try to imagine an organization that has no core purpose, resources or values. How would it last more than a day? *Why* would it last for more than a day? What force would hold it together, or drive it forward? In contrast, an organization with some combination of values, competencies and purpose has at least some sustainability.

Of course, this intuitive way of justifying a structure for managing strategy can leave serious gaps, so it should be verified through its economic grounding. This grounding is verified by noting that the stable base elements are an approximation of the "constrained optimization function", a central but abstract economic tool like the supply-and-demand curve.

III. Mechanics of Flexible Stability

Flexible Stability's stable base elements – core purpose, core values, and core resources – are common elements of strategy approaches. However, they are usually not presented as a whole.

Values and purpose tend to be emphasized in behavior-based approaches; an example is the 1994 book, *Built To Last* by Collins and Porras. On the other extreme, resources tend to be a focus of more technical approaches; an example of this is the 1990 Harvard Business Review article, *The Core Competence of the Organization* by Prahalad and Hamel.

The narrow focuses of these presentations let them create useful models. However, they eventually need to be considered within a broader economic grounding to balance and complete the perspective, which requires understanding them as a whole and their own elements.

Stable Base Elements

In abstract theory, there exist clear distinctions between the three elements of purpose, values and resources. In practice, the distinctions are often not nearly as clear. The following describes the basic distinctions, but more insight can be acquired through observing them in action (as in Section IV's Intel example).

Core Purpose

The core purpose takes into account that individuals generally do not act randomly. It is defined as:

> *the basic motivation that unites individuals as an organization, a force that can be acted on endlessly (or without becoming obsolete).*

For example, based on the research summarized in *Built To Last*, the core purpose of Sony Corporation would be: "To experience the sheer joy of innovation and the application of technology for the benefit and pleasure of the general public."[1] Because of the need for scale and continuity to do so, as well as the motivation conceivably provided by such a proposition regardless of changes in the environment, this would be qualified as a valid core purpose for an organization.

Core Values

Core values refine and fill out the statement of core purpose, stating standards of how the core purpose is to be pursued. Core values are defined as:

[1]Collins, James C. and Jerry I. Porras, Built To Last, HarperCollins Publishers, New York, NY, 1994, p. 237.

the refinement of core purpose into its central elements, identifying how the purpose is to be pursued; as such, they are self-evident ideals and not to be violated.

This definition covers the entire range of potential values, from the lofty (such as respect for employees and community) to the pragmatic (such as quality). However, it is a screen through which very few ideals can pass. Most ideals that are called core values do get compromised because they are actually means to an end, and are set aside when more efficient means are found.

For example, many organizations claim core values such as "a collaborative environment", but a little observation usually demonstrates that the ideal is really only valued when it is the best route to some form of efficiency.

Perhaps even more ideals that are claimed to be core values are simply public relations efforts. For example, a company may claim a core value of "community involvement" or "family friendly" only to protect itself from criticism.

Many of the definitions used for core values assert a fundamental conflict between core values and financial gains. For example, *Built To Last*, presents a fairly typical definition of core values, "The organization's essential and enduring tenets – a small set of general guiding principles; not to be confused with specific cultural or operating practices; not to be compromised for financial gain or short-term expediency".[1]

As in this definition, using core values as a counterforce against focusing excessively on immediate financial gain can be useful for maintaining entrepreneurial energy and progress. However, it is misleading to suggest that core values are fundamentally in conflict with commitment to financial gain. For example, an organization can have a workforce that is drawn by the company's extraordinary focus on financial gain. If so, then including financial gain as a core value provides meaningful insight and is appropriate. The key is that *a criterion for including an ideal as a value in the stable base is that it provides insight to the forces within the organization*, not its extreme loftiness or pragmatism to which many writers on core value gravitate.

Built To Last proposes core values of Sony's that provide illustrative examples. According to the research in *Built to Last*, Sony's core values are:

- "elevation of the Japanese national culture and status"
- "being a pioneer – not following others, but doing the impossible" and
- "respect and encouragement of individual ability and creativity.[2]

Given that the core values would need to support the core purpose inferred to be "the sheer joy of innovation and the application of technology for the benefit and pleasure of the general public", these may be accurate in principle and powerful in practice. For example, one can imagine that "elevation of the Japanese culture and status" and "being a pioneer" are truly top priorities of Sony's founders and have been ingrained in the organization; they could provide great inspiration that captures entrepreneurial energy. It does seem very consistent with the inferred purpose.

However, "respect and encouragement of individual ability and creativity" are highly questionable as a core value. Is the organization so ingrained with appreciation for "respect" and "encouragement" that they would be priorities above all other measures of performance? What if individual creativity was conflicting with focused organizational innovation? Would "respect and encouragement of individual ability and creativity" still be defended? Perhaps, but often values like this are mis-categorized resources, which are lower priorities because they are means to an end. In this specific case, "creativity" could be a core resource that was improperly included as the value, "respect for creativity", because the *Built To Last* framework does not account for resources.

What about a Sony core value associated with financial gain? It is difficult to say, but it might be implied by "elevation of the Japanese national culture and status."

Core Resources

Core resources are the means by which a company can act on its values and in pursuit of its purpose. These resources can range from the very tangible to the very intangible.

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[1] Collins and Porras p. 73.
[2] Collins and Porras p. 237.

Tangible resources are usually physical capital or similar property, such as a patent. Less tangible ones include competencies possessed within the company's human capital, such as relationship building and technical creativity. Another highly intangible resource is the ability to acquire and manage information, which belongs to its own category because a company with a small advantage in information can build a dominating position. Accordingly, core resources are defined as:

> *competencies (human capital-based), assets (physical capital-based), and means of information that allow values be acted upon, generating a competitive advantage in pursuit of a purpose; they remain effective as changes occur but cannot be readily replicated or acquired through markets.*

The key distinction between core resources and core values is that because they are means to an end rather than self-evident ideals, there is less of an obligation to act on core resources.

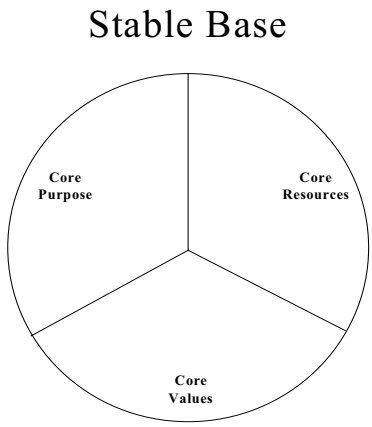
Key Points and Elaborations

*Elements are largely formed naturally, but "stability" does not mean never-changing. An organization's stable base elements are largely natural features that reflect the qualities of key leaders and similar influences. While an organization can aspire to change its stable base, doing so is very difficult (especially for the core purpose and core values) and must be done methodically and consistently to keep from losing stability.

The stable base must match the workforce, so a significant change in the stable base is likely to lead to a significant employee turnover, whether planned or unplanned.

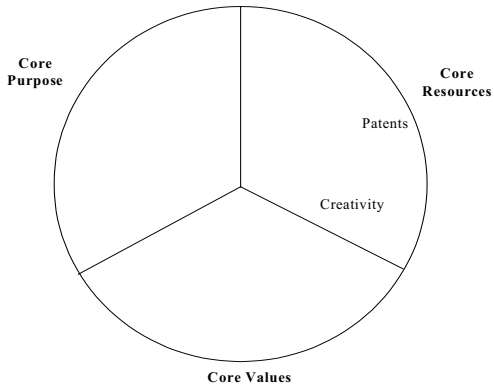
*Accurate and methodical stable base management is a key. Failure to think methodically is likely to reach no deeper than clichés and qualities that reflect current trends or environments, rather than the organization's real, unique elements. This would result in a very *in*stable base because it would lead to tension with both the true nature of the company and with future trends. Similarly, claiming false core elements is destructive because an inaccurate stable base would not be taken seriously, and would probably undermine genuine efforts that may be made in the future to identify and use a stable base.

Because an inaccurate stable base will not be taken seriously, it is important to be careful to avoid mis-categorization, such as identifying resources as values. But it is also true that some may fit partially in more than one category. Accordingly, it helps to see the stable base as a circular continuum:



In such a circular continuum, elements that are purely of one type can be put squarely in the middle of a category (like patents within Resources). In contrast, elements that have features of more than one category can be put closer to the borderline between two ones (like creativity within Resources but near to Values). The rare element that has qualities of all three can be put near the center.

Stable Base Example



*The formalized stable base should be useful. The stable base structure should directly support strategy management, especially in the leaders' decision-making and communication as well as in the employees' self-management. The mere presence of stable base elements reflects the economic forces that can guide these efforts and maintain entrepreneurial energy. However, the elements will provide more useful guidance and magnify the entrepreneurial energy if they are methodically identified and stated.

*The formalized stable base should be concise and only include elements that provide insight. While all elements are stable base candidates in principle, the criterion for being formally included is that they provide insight. For example, "honesty" qualifies as a core value only if there is something about that company's attitude towards honesty that distinguishes the company and is not understood through common sense. Do not include "givens" since difficulty in applying the base will increase rapidly as more elements are added, undermining its usefulness.

IV. Illustration: Intel Corporation

Few businesses can match Intel's entrepreneurial energy and maybe even fewer can match its innovation-driven success. But despite being extraordinarily prosperous and able to count much of personal computing's foundation among its innovations,[1] Intel has had to overcome near fatal changes in its environment in the course of its 35-year history. However, Intel did survive these transitions and even used them as turning points towards greater success with the aid of its powerful stable base. This stable base captured extraordinary entrepreneurial energy and guided the workforce through its strategy transitions. Ironically, this was so even though Intel did not recognize the stable base in a structured way that could have supported decision-making and communication, and could have further reduced the costs of some crises.

An example of this is Intel's transition during the 1980s from a DRAM[2]-focused strategy to a microprocessor[3]-focused strategy. This example demonstrates the importance of possessing a

[1] http://www.intel.com/intel/anniversary/, September 22, 2003; G1.

[2] "Dynamic random access memory (DRAM) A type of semiconductor in which the information is stored in capacitors on a MOS integrated circuit. Typically each bit is stored as an amount of electrical charge in a storage cell consisting of a capacitor and a transistor. Due to leakage the capacitor discharges gradually and the memory cell loses the information. Therefore, to preserve the information, the memory has to be refreshed periodically. Despite this inconvenience, the DRAM is a very popular memory technology because of its high density and consequent low price. The first commercially available DRAM chip was the Intel 1103, introduced in 1970." http://www.hyperdictionary.com/dictionary/dynamic+random+access+memory, September 22, 2003.

[3] "A microprocessor is the central processing unit of a PC. It processes system data and controls other devises in the system, acting as the brains of a PC. One indicator of microprocessor performance is its clock speed, the rate at which its internal logic operates, which is measured in units of hertz, or cycles processed per second." Intel Corporation 2002 10K SEC filing.

stable base as well as of the additional importance of methodically identifying and stating the base as the structure around which strategy is managed.

The Shaping of Intel Corporation

Gordon Moore and Robert Noyce, two of Silicon Valley's leading figures, founded Intel in California in 1968. Noyce was already a creator of the integrated circuit and a prominent businessman,[1] while Moore was "one of the leading physical chemists of his generation" and a "born leader".[2] Soon after, Grove joined them as the director of operations, a surprising choice since he was driven by a "scientific conviction"[3] and his credentials ran towards physics and teaching.[4]

This leadership nucleus established "the conditions that pushed an extraordinary spike of scientific innovation" [5] when it assembled "the most talented engineers in the world and established the framework that let scientific creativity flow"[6] – setting Intel's direction for capturing true entrepreneurial energy.

Moore, Noyce and Grove established Intel with the specific plan of making semiconductor memory more useful[7] by advancing large-scale integrated memory.[8] They believed that they could achieve tremendous success through increasing computers' memory by putting more transistors on a chip.[9] Their motivation to do this came from the difficulty they encountered elsewhere when trying to tie innovation to market opportunities and financial results:

> *"Intel's founding came about, at least in part, because Fairchild Corporation did not want to support the autonomous strategic initiative of Robert Noyce and Gordon Moore that centered around the newly emerging MOS technology. Noyce and Moore saw new business opportunities associated with the new technology that were not apparent to Fairchild's corporate management, of which Fairchild's management was not willing to develop even though the company had spent significant resources on the R&D efforts that produced the new technology. This experience led Noyce and Moore to decision that Intel would not do R&D that is exploratory and not directly related to product development."*[10]

With this, Intel's initial focus was on DRAMs in which, according to Grove, they started modestly. The first product only stored 64 digits and few were sold. Intel introduced its second DRAM product soon thereafter with similar results.[11]

Its third DRAM, however, was a breakthrough product and despite considerable problems manufacturing and delivering the innovative product, "Intel became a business and memory chips became an industry."[12] He elaborates on how these early challenges and successes with innovation and delivery built upon the founders' motivations to form Intel:

> *"As I think back, it's clear to me that struggling with this tough technology and the accompanying manufacturing problems left an indelible imprint on Intel's psyche. We became good at solving problems. We became highly focused on tangible results (our word for it is 'output'). And from all of the early bickering, we developed a style of ferociously arguing with one another while remaining friends (we call this 'constructive confrontation')".*[13]

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[1] Jackson, Tim, Inside Intel, Dutton, New York, NY, 1997, p. 18.
[2] Burgelman, Robert A., Strategy is Destiny, Free Press, New York, NY, 2002, p. 28.
[3] Jackson, p. 145.
[4] Jackson, p. 31.
[5] Jackson, p. 7.
[6] Jackson, p. 7.
[7] http://www.discovery.mala.bc.ca/web/mcdonaldaj/intel.htm.
[8] http://www.intel.com/intel/anniversary/, September 22, 2003.
[9] Grove, p. 82.
[10] Burgelman, p. 50.
[11] Grove, p. 83.
[12] Grove, p. 84.
[13] Grove, p. 84.

This forged a very distinct organization, which was committed not only to leading innovation, but also to bringing these innovations to the mass market.[1] According to Robert Burgelman, a business strategy scholar who has worked closely with Intel, "The early technical heroes at Intel had been TD (technology development) scientists who understood a fundamental physical phenomenon and converted it into a working product prototype."[2] Similarly, the balanced intensity of technical depth and results orientation have been described by other researchers:

> *"The prestige of Intel's stars was never in doubt – the PA (public address) system kept drumming it in, day after day, as announcements went out every few minutes for Doctor Noyce, Doctor Moore, Doctor Grove. But they were very visible, lending a hand where needed."*[3]

The result was that Intel quickly acquired almost 100 percent of the DRAM market in the early 1970s and remained one of the strongest competitors throughout the 1970s, as it was understood that, "Intel still stood for memories; conversely, memories meant (usually) Intel."[4] Intel achieved this by regularly outperforming all others by such an extent that it often avoided competition completely:

> *"During its first decade, the company had prospered by using its strength in research and development to invent entirely new categories of products, and using its ability to master complex processes to win the race to manufacture those products in commercial volumes."*[5]

Intel's Inferred Stable Base

The intensity of Intel's early days, which left an "indelible imprint on Intel's psyche", also forged a powerful stable base that was geared towards linking science with market leadership in integrated electronics – a classic capture of entrepreneurial energy. The following are Intel's stable base elements that can be inferred from the extensive research that has been produced about Intel.

Core Purpose

Intel's core purpose is very evident – to innovate, specifically to innovate integrated electronics. Its founders created the name "Intel" by shortening the expression, "integrated electronics". Thirty-five years later, the "About Intel" web page opens with the statement, "Intel believes in innovation. We're driven by it. We live by it."[6]

Intel's statements and actions provide clear support of the claim that innovating (integrated electronics) is the basic motivation that unites the individuals of Intel and can be acted upon indefinitely. This qualifies **"innovate (integrated electronics)"** as a valid core purpose.

Core Values

Even in a company with a purpose as focused as Intel's, identifying core values can be challenging. However, a good starting point is the core values that the organization itself identifies. Intel formally teaches its employees that its corporate core values are[7]:

- technical depth and excellence;
- discipline in thinking and action;
- a results orientation;
- directness in confronting problems;
- extreme rationality.

Do these qualify as core values, as opposed to core resources or perhaps not very central qualities at all? These questions can be addressed through four tests:

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[1] Jackson, p. 7.
[2] Burgelman, p. 62.
[3] Jackson, p. 37.
[4] Grove, p. 84.
[5] Jackson, p. 185.
[6] http://www.intel.com/intel/index.htm?iid=Homepage+Header_About&, September 19, 2003.
[7] Jackson, p. 10-11.

1. How well do they reflect the core purpose?
2. Are they self-evident priorities, rather than means to an end or low priorities?
3. Are they the standards by which opportunities, results and employees are judged?
4. Is the list concise?

To address the first test, it is important to keep in mind that Intel's purpose is not only technology, but also a much higher standard of innovating technology. Even in an industry as technologically-based as semiconductors, there is a range of degrees to which companies are innovative, demanding extraordinary performance from those who exist to be at the innovative end. The intellectual challenge of this is very consistent with "technical depth and excellence", "discipline in thinking and action", "directness in confronting problems" and "extreme rationality". As for the "results orientation", it is important to recall that a key driver in Noyce and Moore's intention of founding Intel was only to perform R&D that was directly related to product development, and that they acted accordingly. This indicates that their definition of true innovation requires a successful market result, consistent with "a results orientation" being a core value. Similarly, the leaders' "scientific conviction", combined with their results orientation, suggests that these qualities were self-evident priorities in practice, inviolable ways through which Intel pursued its purpose of "innovating (integrated electronics)". Accordingly, they would be standards by which employees are judged.

But could the list be more concise? Burgelman's research has identified two core values: an egalitarian meritocracy based on knowledge power rather than position power, and shareholder value.[1] Would this set of two core values concisely capture the above set of five elements?

The egalitarian meritocracy based on knowledge power rather than position power encompasses the disciplined and rational intellectual power demanded of the workforce. However, intellectual power – even if disciplined and rational – can lead in several directions, some of which value "knowledge for the sake of knowledge" and are not acceptable according to the founders basic desire to have all efforts market oriented. Accordingly, keeping the egalitarian meritocracy focused and capturing entrepreneurial energy requires that the "results orientation" creates a counterforce, which is achieved through a second core value of "shareholder value".

This suggests that Intel's official core values are best seen as elaborations on a more concise set of two core values:

- **Knowledge power above position power**
- **Shareholder value**

Before leaving core values, there are two issues that should be considered.

First, as mentioned in Section III, "shareholder value" is often considered to not be a candidate as a core value. Many business researchers define core values as drivers deeper than, and outside of, financial gain, which makes them more enduring motivators than money. However, the criterion that stable base elements generate insight indicates that "shareholder value" is an appropriate core value for Intel. It matches the organization's intensity and balances its other core value in a way that centers the values as a pair on its purpose of innovating. In addition, Intel did become one of the world's most profitable companies in a relatively short period, which is not likely to occur without a deep drive.

Second, people who have followed Intel might suggest another candidate, "paranoia". Much has been said about how paranoia has been ingrained into Intel's culture and was even in the title of Grove's book, Only the Paranoid Survive. Although paranoia has a negative implication and researchers tend to gravitate towards inspirational values, paranoia qualifies as a potential value. In principle, an organization may value any quality, regardless of tone, even though values with a negative tone are unlikely to be compatible with a stable base that customers will sustain over time. However, paranoia cannot be a core value for Intel because it is irrational in nature,[2] putting it in conflict with the rest of the stable base, and conflicting elements would lead to an *in-*

[1] Burgelman, p. 31.

[2] Merriam-Webster definition of "paranoid": 1 : a psychosis characterized by systematized delusions of persecution or grandeur usually without hallucinations 2 : a tendency on the part of an individual or group toward excessive or irrational suspiciousness and distrustfulness of others.

stable base. Rather, "paranoia" is probably a dramatized statement of the need to watch for and have disciplined responses to changes in the environment.

Core Resources

What are the resources, human or otherwise, that cannot be readily duplicated or acquired on the market and allow Intel to act on its values in pursuit of its purpose while being adaptable to changes? What embodies Intel's entrepreneurial energy? Even with a methodical approach, this category can be the most difficult to identify because of the variables in determining what resources can adapt to changes and re-generate their power. However, some core resources are very apparent in Intel's case.

Competencies (human capital)

Perhaps the central resource at Intel is its engineering staff. Building on Noyce, Moore and Grove, Intel assembled what has been called the most talented set of engineers in the world.[1] The significance of this cannot be understated given that there is absolutely no substitute for engineers in generating the kind of innovation the Intel existed to produce, combined with the competition that exists for top engineering talent. The impact of this talent pool was enormous. For example,

> *"It was a symptom of the technological know-how Bob Noyce and Gordon Moore had assembled at Intel that the company was able to break one of the cardinal rules of the electronics industry. That rule was: You shouldn't try to develop a new circuit design and a new manufacturing process at the same time."*[2]

Much has been written about Intel's excellence in a range of areas. These included "deep distinctive competencies in silicon technology"[3], and the highly technological competencies of "(1) circuit design (Can we design it?), (2) process technology development, called TD (Can we make it?), and (3) manufacturing engineering (Can we manufacture it in large volumes with high yields?)."[4] Others have focused on a distinctive technical marketing competence[5]:

> *"Regarding marketing competencies, Intel's source of competitive advantage had been in entering and exiting a new DRAM generation early to maximize margins and avoid severe price competition."*[6]

or the broader organization's ability to eliminate obstacles to this engineering-driven marketing advantage:

> *"It wasn't the intrinsic merits of Intel's products that brought about this domination. Instead, it was more apparently banal things like distribution, customer support, product range, documentation, and technical development tools."*[7]

The resource that enabled all of this and was most irreplaceable appears to be the superior engineering staff that was directed by the combined core values of a knowledge-based shareholder value, and was the direct link to entrepreneurial energy.

Given this powerful workforce resource, a second core competency was an ability to "**re-write rules**". Intel regularly discarded assumption that constrained competitors, which is shown in their simultaneously innovating a new circuit design and a new manufacturing process. As with this example, rule re-writing started internally as an expression of Intel's drive and confidence generated by entrepreneurial energy, but then expanded much farther.

For example, customers of the semiconductor industry had insisted on a practice called "second sourcing", in which a semiconductor producer licenses its technology to competitors in order to better ensure the customers' supply. Of course, second sourcing also generated much

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[1] Jackson, p. 7.
[2] Jackson, p. 84.
[3] Burgelman, p. 30.
[4] Burgelman, p. 55.
[5] Burgelman, p. 56.
[6] Burgelman, p. 37.
[7] Jackson, p. 7.

greater competition. When Intel acquired a position of strength, it took unilateral steps to end second sourcing,[1] significantly magnifying its competitive strength and the returns to its entrepreneurial energy and innovation.

Information

As a company located within Silicon Valley, Intel probably had the best possible access to external information relevant to innovating integrated electronic. However, it was Intel's internal access to information that may have been most significant.

Specifically, Intel's scientific orientation that encouraged debate had a significant impact on information flow. This impact could have been very negative if it had led to a passive "ivory tower" environment in which intellectual pursuits could neither be questioned, criticized, nor given performance expectations. In addition, a culture of debate can be destructive if it leads to such outcomes as excessive power going to dominant personalities, which could distort information flow and extinguish entrepreneurial energy. But this was not the case at Intel, where

> *"the business merit of different strategic initiatives, constructive confrontation, and the rule that knowledge power should not be overwhelmed by hierarchical position power. Andy Grove maintained that at Intel 'no one was ever told to shut up.' This made it possible for some middle-level managers of the DRAM business to challenge the way Intel was pursuing the business."*[2]

To further ensure that the information flow fit its science- and results-oriented base and that science and debate were brought together, Intel also developed a culture committed to measurement.[3] Consistent with other forms of discipline geared towards tangible results.

> *"Grove believed that writing things down, particularly plans, objectives, progress reports, and the like, was much more important than whether anybody actually read what was written. But the use of objectives and key results was evidence in microcosm of how Intel worked."*[4]

The result of this environment that was driven by **debate that was held to the highest standards of science** was that employees were inclined to focus on substance, letting them to generate their best feasible results even in environments of change and confusion.

Assets (non-human capital)

What tangible assets did Intel possess that could support their competitive advantage even with changes in the environment but could not be readily duplicated or acquired on the market?

The first candidate was a **technology driver**,[5] a means for allowing the engineers to stay ahead of the competition both in terms of advancing products and process.[6] From the early 1970s, the DRAM was equated with Intel's technology driver.[7] Burgelman summarized this as follows:

> *"Struggling to maintain a competitive advantage, Intel continued to rely on innovative TD efforts through several successive DRAM generations. For four successive product generations, the DRAM TD group came up with an innovative process solution that was ahead of its time."*[8]

There are other candidates, such as a "full product line" so that customers could go to Intel for "one stop shopping". But over time it has been shown that a full product line was not of great importance. The remaining candidates, such as "financial strength", seem to be derived from more central elements, available on the market, or just not truly significant.

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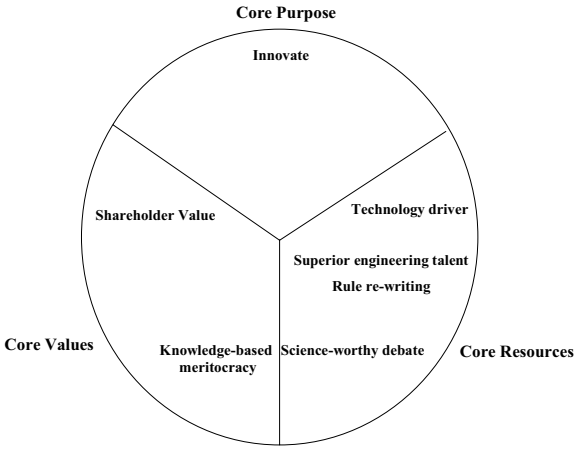
[1] Jackson, p. 8, Grove, pp. 69-70.
[2] Burgelman, p. 67.
[3] Jackson, p. 78, 176.
[4] Jackson, p. 176.
[5] Grove, p. 91: "What this phrase (technology driver) meant was that we always developed and refined our technologies on our memory products first because they were easier to test. Once the technology had been debugged on memories, we would apply it to microprocessors and other products.".
[6] Burgelman, p. 33.
[7] Burgelman, p. 33.
[8] Burgelman, p. 62.

Summary of Inferred Intel Stable Base and Resulting Decision Rules

This set of elements appears to form an internally consistent and balanced stable base, in which Intel's core purpose can be acted on through applying core resources to core values.

Intel's Inferred Stable Base



Given these elements that represent the primary forces that hold together Intel's individuals as a productive organization, Intel could apply the following decision rules when assessing possible courses of action:

- Does this course of action fit a company that innovates (integrated circuits)?
- Does this course of action fit a company that values shareholder value?
- Does this course of action fit a company that values a knowledge-based meritocracy?
- Does this course of action fit a company that relies on a technology driver?
- Does this course of action fit a company that relies on superior engineering talent?
- Does this course of action fit a company that relies on rule re-writing?
- Does this course of action fit a company that relies on science-worthy debate?

Having methodically applied these decision rules, the organization could then take whichever course of action. The key is that it would be taking the action having methodically assessed how it fits the organization's best interests.

The 1980s: Strategic Challenge to Intel's Stable Base

After enjoying a generally dominant first decade, Intel's stable base was tested when its environment changed dramatically around 1980. The emergence of the crisis can be analyzed through sub-structures that Andy Grove has developed from Five Forces – the "10X Force" and the "Strategic Inflection Point". Intel's response can then be analyzed through the Flexible Stability and its stable base structures by demonstrating the importance of possessing a stable base and the additional benefit of recognizing the base as a structure around which strategy is managed.

The 10X Force

Around 1980, Intel experienced a "10X Force", which Grove defines as a change in one of the Five Forces that makes the force "ten times what it was just recently."[1]

The 10X Force that emerged was in Intel's competitive dimension, and occurred when Japanese memory producers became extremely active. During this time, stories were spreading around Intel about Japan's massive DRAM design efforts, aggressive pricing policies and effec-

[1] Grove, p. 30.

tively unlimited resources.[1] During the same time, a key customer, Hewlett-Packard, announced that the quality of Japanese DRAMs was significantly higher than those from US producers, including Intel.[2]

The Strategic Inflection Point

The obvious solutions to this competitive shift (such as improving quality, cutting costs, developing niche products and advancing the technology) were likely to be powerless in the face of the Japanese onslaught and "downward pricing spiral".[3] Accordingly, this 10X Force created a "strategic inflection point", which Grove defines as "a time in the life of a business when its fundamentals are about to change"[4] because "the balance of forces shifts from the old structure, from the old ways of doing business and the old ways of competing, to the new".[5] It can be "a long, torturous struggle"[6] but cannot be truly planned for[7] because you do not know what rules will apply.[8]

Intel's strategic inflection point was an extreme version of the classic strategy decision that leaders of innovative businesses must often manage carefully and effectively:

- continue to compete directly for an established product market, or
- develop a new product and product market.

Specifically, Intel had to decide whether to:

- compete with the Japanese semiconductor producers for the proven DRAM market, or
- leave the DRAM market to focus its resources on developing the market for microprocessors.

Switching to microprocessor innovation was the "obvious" alternative to compete for the DRAM market.[9] Intel, itself, had innovated the first microprocessor as a by-product of DRAM development activities in 1971. The microprocessor was now becoming a central component of the potentially huge IBM-compatible personal computer (PC) industry. In fact, Intel's "386" microprocessor had been designed into the IBM PC in 1981, but pursuing the microprocessor's great potential at Intel required facilities that were being consumed by DRAM production.[10]

Intel recognized this 10X Force and strategic inflection point but was slow to respond. The booming PC market put many of Intel's products in great demand through early 1984,[11] so survival did not require Intel to immediately respond to the DRAM issue.

However, the situation changed in late 1984 when demand for many of Intel's products collapsed. Grove recalled,

> *"Once business slowed down across the board and our other products couldn't take up the slack, the losses really started to hurt. The need for a different memory strategy, one that would stop the hemorrhage, was growing urgent."*[12]

Acknowledging these facts did not lead Intel to an immediate fix. Rather, they led Intel into an agonizing year of "wandering in the valley of death",[13] only after which Grove and Moore finally conceded to exit the DRAM business:[14]

> *"In the middle of 1985, after this aimless wandering had been going on for almost a year. I was in my office with Intel's chairman and CEO, Gordon Moore, and we were discussing our quandary…I asked, 'If we got kicked out and the board brought in a new*

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[1] Grove, p. 85.
[2] Grove, p. 85.
[3] Grove, p. 87.
[4] Grove, p. 3.
[5] Grove, p. 33.
[6] Grove, p. 95.
[7] Grove, p. 5.
[8] Grove, p. 20.
[9] Grove, p. 90-94.
[10] Grove, p. 90-94.
[11] Grove, p. 88.
[12] Grove, p. 88-89.
[13] Grove, p. 89.
[14] Grove, p. 89.

CEO, what do you think he would do?' Gordon answered without hesitation, "He would get us out of memories."[1]

That realization cleared the way for Intel to choose the new strategy that was focused on microprocessors.[2] This decision turned out to be one of the great successes of business history. By the early 1990s, microprocessors were leading Intel to over $10 billion in revenue,[3] making Intel one of the world's most profitable and fastest growing companies[4] and the greatest force in semiconductors.[5]

However, this success was realized only after Intel paid a large price for its slow commitment to strategic change. From 1984 through 1986, Grove recalls,

"These were very hard times and we were losing a lot of money. We had to lay off thousands of employees. We had no immediate use for the silicon fabrication plant where memories were made and had to shut it down. We also shut down assembly plants and testing plants that were involved in the production of memories."[6]

This great expense made Intel's management realized that its strategy management process was far from optimal. As Burgelman points out,

"The organizational turbulence generated by the DRAM exit decision, and the lack of decisiveness in making the decision to begin with, made top management more keenly aware of serious problems with the way Intel's strategic development and key aspects of its operations had evolved."[7]

More pointedly, author Tim Jackson, asks,

"But the praise begs the question of whether Intel could have solved the problem earlier at lower cost. Had Grove responded to the 10X force of Japan more quickly, might Intel today be twice as big and profitable as it is?"[8]

Stable Base and Intel's Strategic Inflection Point

In response to Jackson's question, it is worth noting that the main features of Intel's reaction to its strategic inflection point matched the three areas most impacted by the presence of a stable base and its clear structuring (decision-making, communication, and workforce self-management):

- leadership's difficulty in making a decision about changing its strategy;
- leadership's difficulty in communicating the decision for changing its strategy;
- the workforce's successful anticipation of, and preparation for, the change in strategy.

Specifically, the success in self-management reflected Intel's presence of a stable base. In contrast, the difficulties in decision-making and communication reflected that the stable base was not methodically identified and stated such that it could provide a structure for decision rules that could support strategy management during a time of change.

Decision Making

When looking back at Intel's shift from DRAMs to microprocessors, Grove points out that leaders must make strategic decisions by adopting an "outsider's intellectual objectivity"[9] when their businesses are undergoing a profound change because "people who have no emotional stake in a decision can see what needs to be done sooner."[10]

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[1] Grove, p. 89.
[2] Grove, p. 93.
[3] Grove, p. 11.
[4] http://www.pcanswer.com/articles/intel.htm.
[5] Grove, p. 96.
[6] Grove, p. 94.
[7] Burgelman, p. 48.
[8] Jackson, p. 12.
[9] Grove, p. 93.
[10] Grove, p. 92.

Accordingly, this objectivity enables decision making to be flexible and responsive to the environment. However, this objectivity is not achieved easily. In Intel's case, there were very fundamental and legitimate issues that interacted with emotional issues and blocked objectivity as well as progress.

The dominant legitimate issue was the possibility that the DRAM, itself, was Intel's irreplaceable technology driver. If this were the case, then Intel could not exit the DRAM market despite the competition with Japan because it would lose a core resource for innovating and competing in any market. The other dominant issue was the emotional position held by many leaders across Intel that "Intel equaled memories…How could we give up our identity?"[1]

This pairing of issues interacted in a complex way and left Intel's leadership uncertain how to react, creating rigidity when flexibility was called for:

> *"We had meetings and more meetings, bickering and arguments, resulting in nothing but conflicting proposals…Meanwhile, as the debates raged, we just went on losing more and more money. It was a grim and frustrating year. During that time we worked hard without a clear notion of how things were ever going to get better. We had lost our bearings. We were wandering in the valley of death…"*[2]

"Bearings" are precisely what is obtained by using an economic structure, such as a methodically identified and stated stable base, to guide strategy management. The concise set of the business's core purpose, values and resources could have focused the debate on points of true risk or opportunity (of staying in DRAMs, in this case) and isolated them from points of unnecessary conflict. This, in turn, would have helped generate an outsider's objectivity within the demands of being responsible for real strategic change decisions under pressure.

To apply this concept to Intel's strategic inflection point, first consider the statement "DRAMs are Intel". Even those who were generally disagreeing with one another could have agreed that the position, "DRAMs are Intel", was competing with the position, "shift resources out of DRAMs to lead microprocessor innovation". Intel could have put these alternative positions into objective competition with one another through the decision rules generated by the elements of Intel's stable base which are as follows:

- Innovate (integrated electronics) – "DRAMs are Intel" suggests that it is more important to focus on DRAMs than on performing the most progressive innovation, which conflicts with the purpose of innovating (integrated circuits). Accordingly, Intel's purpose conflicts with "DRAMs are Intel", favoring "Lead microprocessor innovation."
- Knowledge-based meritocracy – Similarly, the confinement implied by "DRAMs are Intel" is in conflict with the operation of a knowledge-based meritocracy, favoring "Lead microprocessor innovation."
- Shareholder value – Eliminating product options because "DRAMs are Intel" is clearly in conflict with shareholder value, further favoring "Lead microprocessor innovation."
- Superior engineering talent – This could be applied to competing for an almost unwinnable market because "DRAMs are Intel" or, in contrast, to "Lead microprocessor innovation", so this element may not favor one position more than the other.
- Rule Re-writing – Intel's competency at recognizing false constraints and rules that can be favorably re-written suggests that a restriction like "DRAMs are Intel" conflicts with its abilities.
- Science-worthy debate – Related to the knowledge-based meritocracy, this resource would be submerged and damaged by "DRAMs are Intel."

The position "DRAMs are Intel" is strongly invalidated by the decision rules. In fact, the exercise indicates that loyalty to the DRAM had become an unofficial core value at Intel, one that was deeply inconsistent with the rest of its stable base and the forces that held Intel together as an

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[1] Grove, p. 89-90.
[2] Grove, p. 89.

organization and kept its entrepreneurial energy alive. Accordingly, the position "DRAMs are Intel" could be seen as a destabilizing and unnecessary obstruction that called for being eliminated.

After achieving this realization, it becomes possible to focus the decision-making process on the last stable base element, whether the DRAM was Intel's technology driver. The details of such an analysis would be highly technical and well outside the scope of a business strategy paper. However, the evidence is that once Intel did isolate this issue, the realization was that with Intel's superior engineering talent, knowledge-based meritocracy and drive to innovate, its technology driver was deeper than the DRAM and that could be transferred to another production line.

The microprocessor was an especially good candidate for replacing the DRAM for housing Intel's technology driver because they shared important common attributes. For example, large volumes of the same device would be produced, the technologies had similar patterns of evolution from one generation to the next, and moving customers from one generation to the next required leading-edge technology that would advance functionality, improve performance and reduce cost. Intel's tremendous innovative success in microprocessors confirms that the microprocessor was, in fact, capable of replacing the DRAM as the housing for Intel's technology driver.

Accordingly, the economic forces of Intel's core purpose, values, and resources all objectively pointed towards the strategic change of shifting out of DRAMs and towards microprocessors where Intel could capture more entrepreneurial energy.

The above analysis suggests that Intel could have greatly reduced the cost and time that it took to make the strategic change from defending the DRAM market to developing the microprocessor market through a decision-making process structured around a formalized stable base. However, three points should be made to round out this conclusion.

First, the stable base is a means for objective comparing priorities and options by being explicit about decision rules, the organization's methodical system for choosing whichever alternative. However, this does not eliminate the ultimate need for leaders to make decisions. Accordingly, if Intel's leadership had gone through the process above, it could have perfectly legitimately concluded with the statement: "We affirm that Intel is DRAMs and DRAMs are Intel." However, this conclusion, would have forced Intel to reject the stable base elements that are inconsistent with such a statement, such as its commitments to innovation and shareholder value. If this had happened, Intel would have come out of the strategic inflection point as a very different company, and probably one with much less entrepreneurial energy and much more employee turnover while not being nearly as innovative or prosperous.

Second, using the stable base elements to objectively structure decision rules does not reduce the challenge of being a leader. Facts remain difficult to isolate. Influences like competition for power, short-term thinking, etc., would continue to drive many individuals to resist even the best, clearest decision making. However, the key is that the stable base structure provides a means for using energy most effectively to those who are focused on bringing the organization to its potential. In contrast, those who are unwilling or unable to cooperate with the business's best interests are likely to be exposed. For these reasons, using the stable base does not encourage passiveness, but rather helps ensure that activity delivers results.

Third, this example demonstrates why it is important to recognize core resources as being distinct from core values. Doing so allows focused thinking about questions like, "Is 'DRAMs are Intel' really a core value for which Intel would be willing to go out of business?" Like almost all other positions (especially those that informally come to be treated as core values) the answer is "no", allowing the question to then turn to whether and how the element fits in with core resources.

Communication

Communication is essentially the act of conveying a decision clearly and credibly. Accordingly, the issues that plague a strategic decision making process will often plague the communication process, too. This was the case in Intel's shift from DRAMs to microprocessors.

After the prolonged and costly decision making process, Grove found himself fighting the same battle with many individuals that he had fought within himself during the decision-making process:

"Intel equaled memories in all of our minds. How could we give up our identity?…Saying it to Gordon was one thing; talking to other people and implementing it in earnest was another…An open-minded, rational discussion about getting out of memories was practically impossible…Not only was I too tentative as I started discussing this course of action with colleagues, I was also talking to people who didn't want to hear what I meant. As I got more and more frustrated that people didn't want to hear what I couldn't get myself to say, I grew more blunt and more specific in my language. The more blunt and specific I got, the more resistance, both overt and covert I ran into…I suppose that even though our minds were made up about where we were going our emotions were still holding both of us back from full commitment to the new direction…"[1]

As this shows – even in the presence of Intel's highly rational business environment and Grove's strong leadership – some individuals' reluctance to cooperate can be strong if the decision rules behind a change in strategy are not clear in both logic and relevance.

Finally in 1986, about a half-decade after the crisis began, Intel's leadership started focusing its communication with a structure that was not highly methodical, but at least provided some means for clarity and credibility:

"To make it through the valley of death successfully, your first task is to form a mental image of what the company should look like when you get to the other side…In 1986, we came up with the slogan 'Intel, the microcomputer company,' that was exactly what we were trying to achieve…It was meant to project our mental image of the company as we would emerge from the valley of death that the 1985-86 memory debacle/ strategic inflection point represented for us…Management writers use the word 'vision' for this. That's too lofty for my taste. What you're trying to do is to capture the essence of the company and the focus of its business. You are trying to define what the company will be, yet that can only be done if you also undertake to define what the company will not be."[2]

This statement points out that the communication of a strategic change need not to be detailed – in fact, it may be impossible for predictions from a truly innovative company to be detailed in a way that is meaningful and concise. However, the communication must be clear so that the workforce is confident that it understands why the change is being made, why the change should be expected to be maintained, and why some actions will be rewarded while others will not be.

In parallel to the decision-making process, communicating Intel's strategy of shifting from DRAMs to microprocessors could have been streamlined around a formalized stable base by affirming that Intel's purpose was to innovate, and to do so in a knowledge-based meritocracy that creates shareholder value, through engineering talent, rule re-writing and science worthy debate about its technology driver. A pointed statement could then be made that these ideals cannot be pursued through unchallenged loyalty to the DRAM. Rather, they will be preserved and advanced through the best possible means, which is shifting emphasis to microprocessors.

Self-Management

Intel not only survived this unstructured decision-making and communication process, but even thrived because its stable base – forged through Intel's early challenges and successes – was at work within the ranks of employees during the early and middle 1980s when leadership was struggling with the strategic inflection point. This is because although Intel's stable base lacked a formal structuring, the "indelible imprint on Intel's psyche" from its early days generated stable base elements with strong characteristics that were able to keep entrepreneurial energy focused and productive. Like in Five Forces, these elements represent economic forces so while methodically recognizing and managing them can greatly increase control over them, they will usually remain active even when not recognized or well-understood.

Specifically, although Intel's leadership was looking for direction in its decision-making and communication until 1986, by 1984 the workforce had started anticipating the strategic shift

[1] Grove, p. 89-92.
[2] Grove, p. 140.

and was self-managing itself to such an extent that it had already transformed Intel into a microprocessor company[1] as Grove describes it,

> *"While Intel's business changed and management was looking for clever memory strategies and arguing among themselves, trying to figure out how to fight an unwinnable war, men and women lower in the organization, unbeknownst to us, got us ready to execute the strategic turn that saved our necks and gave us a great future…The exit decision had less drastic consequences as a result of the actions of our middle managers."*[2]

How could Intel's workforce possess such constructive – quick and controlled – flexibility?

On one level, the explanation is simple. Intel had a rule by which production capacity was to be allocated to different products according to a specified measure of profitability. This rule was very consistent with the stable base; it was highly rational and focused on share-holder value while it "captured a great amount of information about internal and external conditions."[3] By applying the rule, Intel's middle managers were reallocating production capacity such that Intel was producing DRAMs in only one out of eight factories,[4] leaving DRAMs to account for only 5% of their revenues by 1984.[5]

However, this simplistic conclusion would be misleading; it is important to realize that it was the employees' self-management and flexibility, not the rule, that shifted Intel from DRAMs to microprocessors. Businesses have countless rules that are disregarded or applied sporadically because of conflicts among formal rules or other reasons including fear of punishment. In Intel's case, as Burgelman points out, "it was unclear how middle-level managers could take actions that were not in line with the official corporate strategy."[6] Besides, the workforce's initiative went beyond applying official rules. For example, in 1984, a full year before leadership had accepted the need to shift from DRAMs to microprocessors, "some middle-level managers had made the decision to adopt a new process technology which inherently favored logic (microprocessor) rather than memory advances, thereby limiting the decision space within which top management could operate."[7]

Much research has studied the issue of how Intel's workforce could move as a unit against the chaos of its environment – and even against the official corporate strategy – to position Intel for its great success with microprocessors. Burgelman, himself, helps clarify how the workforce was able to do this by pointing out that the workforce did not passively let the maximize-margin-per-wafer-start rule determine what would happen. Rather, he finds that open debates – debates that were held to the highest standards of science – were the driving force behind the workforce's decisions and application of the rule.[8]

These debates demonstrate that the economic forces within Intel's core elements were sufficiently powerful during the strategic inflection point that they were able to guide the workforce's self-management, creating an organizational flexibility that was quick but controlled because it was anchored in a stable base (most notably, through the element of science-worthy debate). The reference point established by the stable base provided the individuals with confidence to sort through the various rules and official strategy statements, develop a sense of what discretionary actions would be ultimately rewarded, and a sense of what discretionary actions would be taken by others, along with the direction that Intel as an organization would pursue.

Enabled by the stable base, this flexibility renewed the organization's core purpose, values and resources by reapplying them effectively and powerfully in the new environment. This renewal of the stable case completed the circle in which stability enabled flexibility and flexibility enabled stability.

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[1] Burgelman, p. 51.
[2] Grove, p. 96-97.
[3] Burgelman, p. 66.
[4] Grove, p. 97.
[5] Burgelman, p. 32.
[6] Burgelman, p. 54.
[7] Burgelman, p. 41.
[8] Burgelman, p. 71.

As a result, Intel was able to overcome its slow official response to its 10X force and strategic inflection point. Rather than collapsing by responding to a great challenge with either rigidity or uncontrolled fluctuations, as have many once-strong innovative companies, Intel was then able to use its mutually reinforcing stability and flexibility to capture the change as renewed entrepreneurial energy.

This, in turn allowed Intel to transform the strategic inflection point into an opportunity to "catapult itself"[1] to a higher level of innovation, increasing its prosperity as well as its contributions to economic progress.

V. Conclusion

It is a tremendous challenge to establish, lead, manage or work within an innovation-driven business, one that prospers while driving an economy's progress. However, the potential reward is unlimited for those who do succeed by continuously capturing the entrepreneurial energy that the economy's innovation system creates. This is best done through managing strategy from a stable base structured out of the company's core purpose, values, and resources – the economic forces within an organization.

This is critical because the environment of true change makes innovation-driven success more of a matter of preparation than of prediction. In 1967 nobody could have reasonably predicted the contributions to economic progress to be made by the not-yet-established Intel; it could have been even more difficult in the early 1980s to predict that the strategically-challenged Intel was yet to experience its greatest prosperity. However, Intel did achieve these successes because it possessed the elements of a stable base that allowed the leaders to build a company that its workforce was prepared to sustain.

Today, it is no easier to predict which companies will come into existence or pull out of crises to lead tomorrow's economic progress while achieving extraordinary prosperity. What can be said, according to Bruce P. Mehlman, Assistant Secretary for Technology Policy at the United States of Commerce, is that,

> *"Driven by convergence, globalization and radically disruptive new technologies such as nanotechnology, changes in the 21st century will come faster, disruptions to legacy business models and products will cut deeper and the nations, firms, and individuals who succeed will be those best able to adapt."*[2]

With these forces growing in the global economy, the advantage in adapting and succeeding will go to those who possess clear knowledge of their stable bases, the forces that unite their companies' individuals as organizations and can be focused on emerging opportunities. These are the companies that are best prepared to capture the rewards of the progress that Thomas Jefferson claimed can continue without end, a conviction that has been demonstrated by history and is being renewed in the present.

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[1] Grove, p. 95.

[2] "Technology Administration: 21st Century Policy Challenges for American Innovation Leadership – Remarks by Bruce P. Mehlman, Assistant Secretary for Technology Policy, United States Department of Commerce", presented before Georgia Institute of Technology (Atlanta, GA, Oct. 23, 2003), Kennedy School of Government (Boston, MA, Oct. 1, 2003, and Computer & Communications Industry Association (Washington, DC, Sept. 25, 2003).