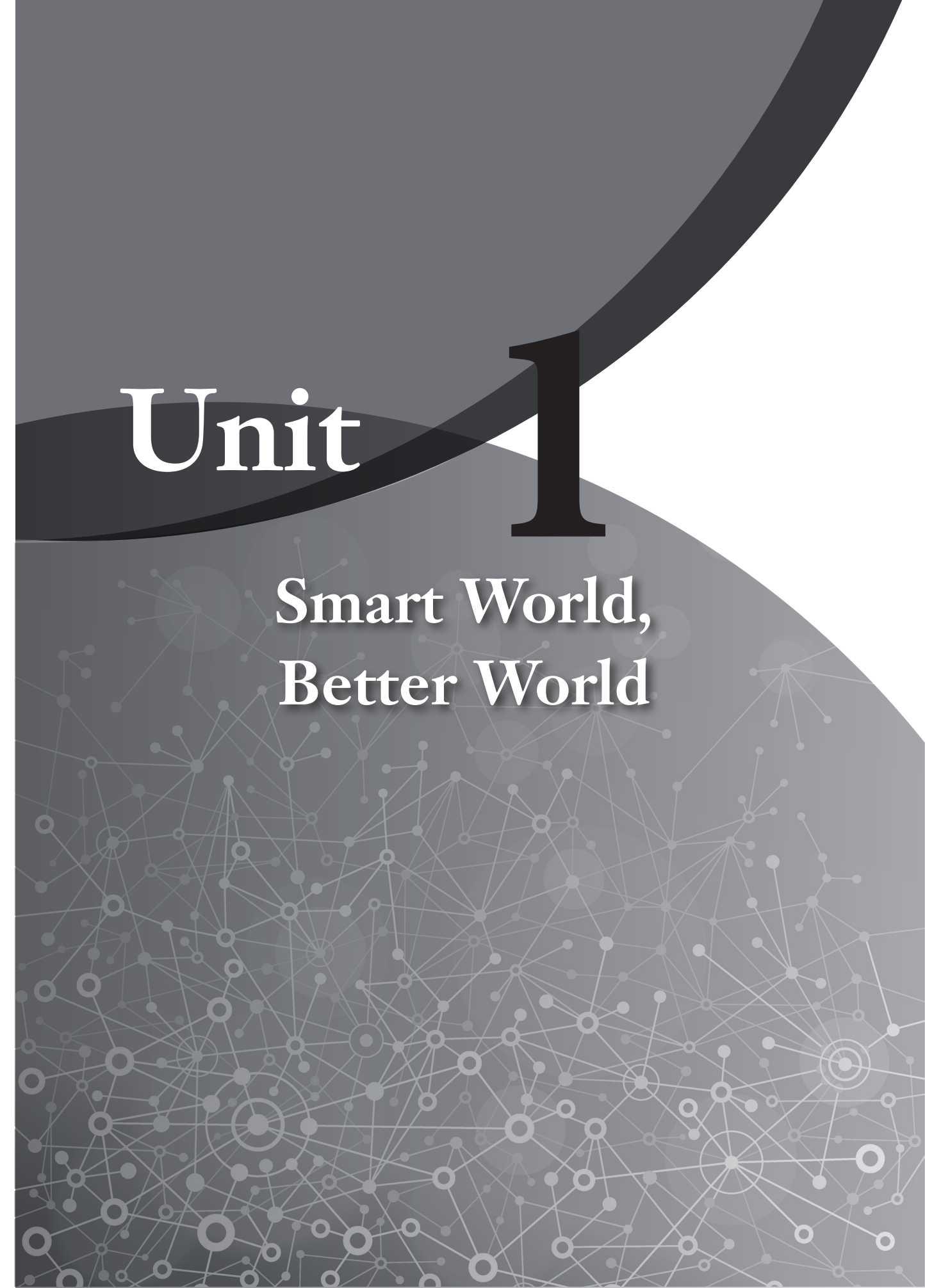


Unit

1

Smart World,
Better World



Part I
Reading

Despite Chip Shortage, Chip Innovation Is Booming

Don Clark

- ① A global shortage of semiconductors has **cast** a cloud over the plans of carmakers and other companies. But there's a **silver lining** for Silicon Valley executives like Aart de Geus.
- ② He is chairman and co-chief executive of Synopsys, the biggest supplier of software that engineers use to design chips. That position gives Mr. de Geus an intimate perspective on a 60-year-old industry that until recently was showing its age.
- ③ Everyone now seems to want his opinion, as shown by the dozens of emails, calls and comments he received after addressing a recent online gathering for customers. Synopsys says people **tuned in** from 408 companies—more than double the number for an **in-person event** last held in 2019—and many weren't conventional chip makers.
- ④ They came from cloud services, consumer electronics companies, defense contractors, auto component providers, U.S. government agencies, universities, two Bitcoin mining companies and a furniture maker. Their **overriding** question is: How do you develop chips more quickly?
- ⑤ Even as a chip shortage is causing trouble for all sorts of industries, the semiconductor field is entering a surprising new era of creativity, from industry giants to innovative **start-ups** seeing a **spike** in funding from **venture capitalists** that traditionally avoided chip makers.
- ⑥ Taiwan Semiconductor Manufacturing Company and Samsung Electronics, for example, have managed the increasingly difficult **feat** of packing more

transistors on each slice of silicon. IBM on Thursday announced another leap in **miniaturization**, a sign of continued U.S. **prowess** in the technology race.

- 7 Perhaps most striking, what was a **trickle** of new chip companies is now approaching a flood. **Equity** investors for years viewed semiconductor companies as too costly to set up, but in 2020 **plowed** more than \$12 billion **into** 407 chip-related companies, according to CB Insights.
- 8 Though a tiny fraction of all venture capital investments, that was more than double what the industry received in 2019 and eight times the total for 2016. Synopsys is tracking more than 200 start-ups designing chips for artificial intelligence, the ultrahot technology powering everything from smart speakers to self-driving cars.
- 9 Cerebras, a start-up that sells massive artificial-intelligence processors that **span** an entire silicon **wafer**, for example, has attracted more than \$475 million. Groq, a start-up whose chief executive previously helped design an artificial-intelligence chip for Google, has raised \$367 million.
- 10 “It’s a bloody miracle,” said Jim Keller, a **veteran** chip designer whose résumé includes stints at Apple, Tesla, and Intel and who now works at the AI chip start-up Tenstorrent. “Ten years ago you couldn’t do a hardware start-up.”
- 11 The trends are not necessarily good news for chip customers, at least for the short term. Scarce supplies of many chips have manufacturers **scrambling** to increase production, and are adding to worries in Washington about reliance on foreign suppliers. Extra demand could extend the shortages, which are already expected to last into 2022.
- 12 High demand was evident in earnings for chip companies last quarter, which ended in March. Revenue grew 27 percent, for example, at NXP Semiconductors, a big maker of auto, communications, and industrial chips, even though it temporarily closed two Texas factories because of a **cold snap**.
- 13 The industry has historically been notorious for **booms and busts**, usually driven by purchasing swings for particular products like PCs and smartphones. Global chip revenue **slumped** 12 percent in 2019 before bouncing back with 10 percent growth last year, according to estimates from Gartner, a research firm.

- 14 But there is widening optimism that the cycles should moderate because chips are now used in so many things. Philip Gallagher, chief executive of the big electronics distributor Avnet, cited examples like sensors to track dairy cows, the flow of beer taps and utility pipes, and the temperature of produce. And the number of chips in mainstay products like cars and smartphones keeps rising, he and other executives say.
- 15 “This is a lasting growth cycle, not a short spike,” said Kurt Sievers, NXP’s chief executive.
- 16 A longtime industry watcher, Handel Jones, who heads the consultancy International Business Strategies, sees total chip revenues rising steadily to \$1.2 trillion by 2030 from roughly \$500 billion this year.
- 17 That growth could arrive just as the industry fundamentally changes. More companies are concluding that software running on standard Intel-style microprocessors is not the best solution for all problems. For that reason, companies like Cisco Systems and Hewlett Packard Enterprise have long designed specialty chips for products such as networking gear.
- 18 Giants like Apple, Amazon, and Google more recently have gotten into the act. Google’s YouTube unit recently disclosed its first internally developed chip to speed video encoding. And Volkswagen even said last week that it would develop its own processor to manage autonomous driving.
- 19 Chip design teams are no longer working just for traditional chip companies, said Pierre Lamond, a 90-year-old venture capitalist who joined the chip industry in 1957. “They are breaking new ground in many respects,” he said.
- 20 Chip design software gained popularity in the 1980s to streamline tasks that engineers once carried out with pencils and drafting tables, painstakingly drawing clusters of transistors and other components on chips. The software tools have continually evolved; some carmakers, for example, use Synopsys-powered simulations of how future chips will work to write software for them in advance, Mr. de Geus said.
- 21 Synopsys, which he co-founded in 1986, has grown steadily, partly by **acquisitions**, to a valuation of \$36 billion.

- 22 Mr. de Geus said new growth was coming from what seemed like a problem: a slowdown in Moore's Law, industry shorthand for the **perennial** race to shrink chip circuitry so chips do more with less silicon. In response, he said, some companies are using Synopsys tools to design entire systems and bundles of smaller chips that work like a single processor.
- 23 During his recent speech to users, Mr. de Geus demonstrated how artificial-intelligence enhancements could allow Synopsys tools to automatically decide how best to situate and connect blocks of **circuitry** on a chip. A system managed by a single engineer did the work two to five times faster than a team of designers, Mr. de Geus said, while its design used up to 13 percent less energy.
- 24 "The ability to use AI to design AI chips, that is the ultimate cool," he said. "There you meet science fiction."

→ Words and Expressions

cast *vt.* to make light, a shadow, etc. appear in a particular place 投射（光、影子等）

silver lining a consoling or hopeful prospect in a sad or unpleasant situation（不幸或失望中的）一线希望

tune in to regulate (a radio or television set) in order to receive a certain station or program 收听；收看；调谐

in-person event 面对面活动

overriding *adj.* more important than anything else in a particular situation 最重要的；首要的；凌驾一切的

start-up *n.* a company that is just beginning to operate, especially an Internet company 刚成立的公司，新企业（尤指互联网公司）

spike *n.* a sudden large increase in something 猛增；急升

venture capitalist a speculator who makes money available for innovative projects (especially in high technology) 风险投资家，创业投资家

feat *n.* an action or a piece of work that needs skill, strength or courage 技艺；功绩

miniaturization *n.* the act of making on a greatly reduced scale 小型化，微型化

pro prowess *n.* a superior skill that you can learn by study and practice and observation 超凡的技术

trickle *n.* flowing in drops; the formation and falling of drops of liquid 滴, 淌;
细流

equity *n.* the value of a company's shares; the value of a property after all charges
and debts have been paid (公司的) 股本; 资产净值

plow...into to invest; to buy property, shares in a company, etc. in the hope of
making a profit 投资

span *vt.* to include a large area or a lot of things 包括 (广大地区); 涵盖 (多项内容)

wafer *n.* a thin slice of semiconductor (as silicon) used as a base for an electronic
component or circuit 晶片

veteran *adj.* rendered competent through trial and experience 老练的, 经验丰富的

scramble *vt.* to manage to achieve something with difficulty, or in a hurry, without
much control 艰难 / 仓促地完成某事

cold snap a sudden short period of very cold weather 寒流, 寒潮

booms and busts alternate periods of high and low levels of economic activity in
the business cycle 繁荣与萧条; 商业兴衰

slump *vi.* to fall in price, value, number, etc. suddenly and by a large amount (价格、
价值、数量等) 骤降, 猛跌, 锐减

acquisition *n.* a company, piece of land, etc. bought by somebody, especially
another company; the act of buying it 收购的公司; 购置的产业; 购置; 收购

perennial *adj.* continuing for a very long time; happening again and again 长久的;
持续的; 反复出现的

circuitry *n.* a system of electrical circuits or the equipment that forms this 电路系统;
电路; 电路装置

→ Notes

1. Synopsys 美国新思科技公司

为全球集成电路设计提供电子设计自动化 (EDA) 软件工具的主导企业, 成立于 1986 年, 总部位于美国加利福尼亚州山景城。该企业为全球电子市场提供技术先进的 IC 设计与验证平台, 致力于复杂的芯片级系统 (SoC) 的开发。

2. Bitcoin mining 比特币挖矿

比特币挖矿是获得比特币的一种方法。比特币是一种由开源的 P2P 软件产生的网络虚拟货币, 要获得比特币, 就必须去解复杂的算法。人们把比特币称为“数字黄金”, 把寻找正确数字的过程称为挖矿。

3. **Taiwan Semiconductor Manufacturing Company (TSMC)** 台湾积体电路制造股份有限公司（台积电）

台积电成立于 1987 年，是全球第一家专业积体电路制造服务企业，总部与主要工厂位于中国台湾的新竹市科学园区。
4. **Samsung Electronics** 三星电子

三星集团旗下的子公司，韩国最大的消费电子产品及电子组件制造商，也是全球最大的信息技术公司。目前三星电子的主要经营项目包括半导体、行动通讯、数位影像、电信系统、IT 解决方案及数字应用。
5. **CB Insights**

CB (Chubby Brain) Insights 是全球领先的科技市场数据平台，2008 年成立于纽约。通过数据和智能算法，CB Insights 为私募股权、风投、媒体、跨国及创业公司提供完整的技术及市场解决方案，并定期发布数据报告及行业榜单。
6. **NXP Semiconductors** 恩智浦半导体公司

该公司前身为荷兰飞利浦公司的半导体事业部，2006 年从飞利浦公司脱离出来。2015 年，恩智浦收购飞思卡尔半导体，成为全球最大的非存储类半导体公司之一，为安全识别、汽车和数字网络领域提供半导体。
7. **Avnet** 安富利集团

全球最大的电子元件、计算机产品和嵌入技术分销商之一，总部位于美国亚利桑那州凤凰城，服务于全球 70 多个国家和地区的客户。
8. **Cisco Systems** 思科系统

全球最大的网络技术公司，于 1984 年 12 月在美国成立，总部设于加利福尼亚州硅谷的圣何塞，其产品涉及网络设备、软件、物联网、移动和无线网络、网络安全、音视频通信、数据中心、云计算等。
9. **Hewlett Packard Enterprise (HPE)** 慧与公司

从惠普公司分拆并独立运营的一家财富 500 强上市公司，其业务范围主要涵盖服务器、存储、网络、软件、金融服务、咨询等，提供前沿的技术解决方案，帮助客户优化传统 IT，打造安全的基于云且具备移动性的未来架构。
10. **Moore's Law** 摩尔定律

摩尔定律指的是当价格不变时，集成电路上可容纳的元器件的数量，每隔 18 ~ 24 个月便会增加一倍，性能也将提升一倍。这一定律揭示了信息技术进步的速度。

→ Reading Skills

Surveying, Skimming and Scanning

Surveying a text is to take a broad look at the text, focusing on the general aspects, such as information about the author, date of publication, title, subtitle, introduction, and conclusion, rather than details. The main purpose is to determine the value of the text and whether or not it is worth reading more closely. For example, from the title of the text, “Despite Chip Shortage, Chip Innovation Is Booming”, you can see that the text focuses on the field of chips, and then you can decide whether to proceed with your reading.

Skimming means reading quickly to get the gist of a text. It is concerned with finding general information, namely the main ideas. Therefore, it involves checking some elements like the first paragraph, the last paragraph, repeated words, section headings, the first sentence of each paragraph, and the last sentence of each paragraph. It helps you know what the text is all about at a basic level. Take the first paragraph as an example. It shows that a global shortage of semiconductors has a negative effect on carmakers and other companies but has a positive effect on Silicon Valley executives like Aart de Geus. The contrast sparks your interest in the reasons for the two opposite results. Then you go further to the first sentence of the second paragraph. It introduces the title of Aart de Geus, who comes from a representative company supplying software that engineers use to design chips. This information helps you get a brief idea of what the text is about, as well as a better understanding of the underlying importance of chips in this text.

Another important strategy for speed reading is scanning. Unlike skimming, scanning a text means going through it quickly to find specific information without reading all the details. To successfully scan a text, you need to first figure out how the text is organized. This is because it often gives you clues to identify which sections might contain the information you are looking for, such as time markers in a text arranged chronologically or subheadings in a text structured by themes. For this text, the most obvious feature is that it contains many proper

nouns like company names, personal names and titles, which are helpful in locating relevant sections that need to be scanned. Second, it is important to keep the concept of key words in mind while scanning. Suppose you are looking for the answer to the question “What’s the big change that has happened to the customers of Synopsys?” With proper scanning, you do not have to read every word or look at all the information. Just look for the terms “change” and “customers of Synopsys”, and you can quickly find the answer in Para. 3.

→ Exercises

I. Building Vocabulary

Choose the best word in the box to fill in each blank. Use each word only once and make proper changes where necessary.

slump	venture	scramble	trickle	spike
span	veteran	massive	notorious	overriding

1. But the _____ priority for NATO seemed to be providing air support for outnumbered ground troops under continuous attack.
2. A(n) _____ in diabetes during pregnancy, worsened by the pandemic, raises the risk of chronic diabetes, heart disease, and birth complications.
3. According to Scanlon, the surprising success of Velocity at Discovery inspired the new _____ and the decision to launch as a free streaming network.
4. Hurricane Ian’s _____ storm surge shows how the climate is changing due to sea level rise.
5. The store will _____ seven floors in a mixed-use, retail, hotel and high-rise residential tower.
6. If your project is opposed by, for example, a group of _____ employees, ask another old-timer to speak up for it.
7. Because of bottlenecks in the global supply chain, many stores are _____ to try to get all the inventory ahead of the crucial holiday shopping season.

8. The camp became _____ for the torture and inhumane treatment of its prisoners.
9. Meanwhile, the housing market continues to _____, with home builders sharply cutting back on construction projects.
10. Just 15 years ago, Singapore allowed only a(n) _____ of foreign newspapers into the country.

II. Understanding the Text

Skim and scan the text. Answer the following questions.

1. What does the author mean when he states that “Synopsys was showing its age until recently” in Para. 2?
2. What’s the big change that has happened to the customers of Synopsys?
3. Why are venture capitalists traditionally not willing to invest in chip makers?
4. What is the writing purpose of Para. 8 and Para. 9?
5. In Para. 10, why did Jim Keller regard it as a “bloody miracle”?
6. How does the author illustrate that “the cycles should moderate”?
7. The text ends with the sentence “There you meet science fiction.” What does it suggest?

III. Theme Exploration

Chips, semiconductors, and integrated circuits are important concepts in the field of electronics. As technology continues to develop, their application scopes and influences are also expanding. Discuss the relationship among them and their applications in our daily life.

IV. Real-Life Project

Semiconductor chips play an essential role in modern manufacturing, but the recent global shortage of chips has threatened the delivery of products ranging from PCs to automobiles to consumer electronics. What is causing this shortage? What effects does it bring about? When can we expect it to ease? Please search for relevant