RT Dictation

In today's business environment, more and more study
is required in considering how to optimize the use of
infrastructure. It is necessary for public investors to
identify adequate return mechanisms that will ensure the
long-term financial sustainability of high-performance
computing investments. There must be increased awareness
among policy makers, industry and society of the public
value of high-performance computing.

The digital economy is expanding rapidly worldwide.
It is the most important component of innovation,
competition, and growth. Supercomputing generates the
adoption of digital innovations across many different
industries. The power of supercomputing in combination
with artificial intelligence and the use of big data
provides many opportunities for transforming commerce, the
public sector and our communities.

High-performance computers are making an impact on
the everyday life of citizens by helping to address most
of the critical needs of society. Both researchers and
entrepreneurs are able to solve complex issues and develop
new treatments based on personalized medicine. They are
also better able to predict and manage the effects of

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natural disasters through the use of advanced computer simulations.

The demand for high-performance computers is expected to increase considerably in the coming years which will cause industry to leap forward into the next generation of technological progress. Even though the potential is huge, serious challenges yet remain. Businesses, public authorities and researchers must have equal access to facilities and services. Significant investment in infrastructure as well as fresh investment in new business development should also be top priorities.

High-performance computing uses massive processing techniques and supercomputers to solve complex computing problems. This is accomplished through modeling, simulation and data analysis. This brings together computer architecture programs, electronics, application software and multiple other technologies under a single system. A desktop computer generally contains a central processing unit, also called a microprocessor or logic chip. A supercomputing system represents a network of microprocessors. Each logic chip contains multiple computing cores as well as its own local memory and is able to run a wide range of software programs.

The advent of high-performance computing has an impact on almost every aspect of our daily life.

Airplanes, buildings and consumer goods are designed using this type of capability. Weather forecasts, the discovery of new drugs and advanced business analytics all use supercomputing power in almost everything they do. Supercomputing has become a valuable tool for supporting better decision making, manufacturing and planning and development.

The combination of high-performance computing, big data and cloud computing will encourage the rapid growth of creative applications across multiple sectors, including the economy. The use of these services over the cloud will make it easier for smaller enterprises that do not have the necessary funds to invest in order to develop and produce better products and services.

Financing a supercomputing facility is challenging because of the large amount of resources required and the length of time over which financing must be sustained. This has often resulted in serious underinvestment. While some countries have invested heavily in supercomputing infrastructure and capacity, others have been somewhat slow to make the necessary investments. There is currently a race underway in which countries are competing to be the first to create a system which is capable of a billion billion calculations per second. It is important to note that the perfection of such a supercomputer could

result in important advances in a variety of fields.

The landscape is mainly driven by the public sector in terms of usage as well as monetary support. Ninety percent of capacity and use is located at major universities or academic research centers. The remaining ten percent is installed for commercial use or with end users. Most of the money comes in the form of grants from government which cover both start-up needs and operating costs. Some of these centers have begun to broaden the scope of application towards more commercial use so that new revenue streams can be realized. While such a trend is important for creating a viable business model, sometimes there are statutory limits to the share of revenues.

High-performance computing is absolutely vital to the new global economy. The dramatic increase in the amount and variety of big data creates new possibilities for sharing knowledge, conducting research, doing business and promoting sound public policies. Thanks to its ability to process large amounts of data, the application of this technology means that citizens are already benefiting from its use in sectors like health care, weather, clean energy and cybersecurity.

A world-class infrastructure is critical to assist industry, science, small enterprises and the public

sector. It is projected that public subsidies will not be enough to sustain supercomputing in the coming years. A wide range of solutions is vital, such as dedicated financial support and public and private partnerships.

The high-performance computer software market is largely dominated by four or five companies. Competitors often attempt to provide software solutions that are versatile enough to cover a wide range of industry applications. Typically, a small independent software vendor will partner with a larger organization in order to gain access to wider distribution channels. In return, the smaller vendor may receive royalties for their offerings. For larger vendors, this is a welcome opportunity to add more specific products to their portfolio at no additional cost.

Because of increasing competition from larger players and the limited availability of financing, independent vendors try hard to improve their operations. In many cases, the only viable option for growth is through acquisition of small market leaders by their competitors.

A key aspect of more commercial business models is to offer the highest data protection, cybersecurity and data privacy standards. The protection of intellectual property and the data ownership of users must be without

question. The success of commercial models is partly dependent on the confidence of users that their privacy will not be at risk.

The use of high-performance computing has become widespread across education, government agencies and virtually all sectors of commerce. Software programs are rapidly being integrated into the design, development and improvement of products in the fields of energy, transportation, and manufacturing. Medicine, communications and finance also benefit from supercomputing. It is well suited to performing tasks that require complex number calculations to be executed on extensive data sets in short time frames.

Supercomputing will have practical applications in everything from precision medicine to regional climate, water usage to engineering, nuclear physics to national security. This manner of computing has the potential to generate exploration across a broad spectrum of scientific fields and to improve both our understanding of the world and how we exist in it.

In spite of the demand for high-performance computing, challenges to broadening its use remain. Providers must be more flexible and adaptive. End users are looking for reliable and affordable services.

The advanced technologies now being introduced in

public communications networks create additional
requirements concerning the protection of personal
information and privacy. (10:00)

The information society is characterized by the introduction of new electronic communications. Access to digital mobile networks has become available and affordable for a large part of the public. These digital networks have large capacities and possibilities for processing personal data. (88)

The Internet has overturned traditional market structures by providing a common, global infrastructure for the delivery of a wide range of electronic services. Publicly available electronic communications over the Internet open new possibilities for users, but also new risks for their personal data and privacy. (95)

In response to data protection and cybersecurity challenges, there is an emerging specialty market of commercially driven computer providers in Europe. These companies offer highly flexible on-demand cloud-based services that abide by the highest data security and privacy standards. (84)

At the same time, there is an important market trend pointing to increased reliance on cheaper service providers. Since data processing is not bound by geographic borders, demand for certain services usually goes to the lowest-priced provider. Despite data

integrity concerns, European stakeholders increasingly
use American high-performance and cloud computing
services. (103)

New thinking is required about how to optimize the
use of this type of infrastructure to ensure good socio
economic returns. Awareness among policy makers,
industry and society needs to be increased. This will
provide a new rationale for public investment and public
value creation as a basis for improving the conditions
for robust and long-term financing. (103)