

Green software and services realized through new Software Carbon Intensity (SCI) method



The Green Software Foundation, in which NTT DATA participates as a Steering Member, has developed the alpha version of "Software Carbon Intensity" (SCI), a method for evaluating the carbon footprint of software. NTT DATA is contributing to the achievement of a carbon neutral society through technology development that utilizes SCI to deliver green software and services.

In recent years, the effort to reduce carbon emissions has gained force globally. Within the IT field, there is a growing movement to reduce greenhouse gas emissions by 45% by 2030. In the area of software development and operation, companies are investigating ways to reduce their carbon footprint, and a method of evaluation that properly reflects efforts to reduce emissions is now being sought. With this background, SCI was formulated to evaluate the carbon footprint of software operation with scores based on power and hardware usages and the carbon intensity of power usage. Use of this method makes it possible to compare the environmental burdens of software products with the same functions, and to grasp the effects of software modifications upon carbon emissions. This means of analysis can also be used to select software with a low environmental burden, and to aid in the development of software products and software operation technologies with small carbon footprints.

Through these activities, we will establish technologies and methodologies for developing and operating software that imposes a lower environmental burden. Then, by applying them to the social infrastructure, we aim to return value to society as a whole.

An optimized society cultivated through Adaptive Bulk Search (ABS)



To optimize energy utilization, distribution and other aspects of society as a whole, NTT DATA and Hiroshima University have developed "Adaptive Bulk Search" (ABS). ABS realizes versatile, high-speed calculations that make it possible to make quantitative decisions based on vast amounts of data and options.

Methods such as AI and machine learning are now bringing new vitality to efforts to use computing power to replace or assist human decision-making. Mathematical optimization is attracting attention as a means of eliciting the most appropriate choice from among a vast number of combinations, amidst a variety of tradeoffs. However, in order to solve optimization problems rapidly and accurately, you need to select the most appropriate software and hardware for each problem. Moreover, the solutions needed to efficiently solve extremely difficult optimization problems can be very expensive. With ABS, a common format can be used to input problems from various industries. And by making the relative difficulty of solving a problem less dependent on the specifics of that problem, ABS enables solutions to a wider range of issues. In addition, because ABS utilizes general-purpose graphics processing unit (GPU) products, computing speed can be increased in proportion to the number and performance of the GPUs. These features make it possible to perform calculations that are high speed and have a multiplicity of uses, further expanding the range of problems that can be handled. NTT DATA aims to promote social development and solve social problems by elucidating the challenges and potential of a broad spectrum of calculation techniques to arrive at new computing mechanisms.

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A Compass for the Present and Future of IT and Business

NTT DATA Technology Foresight is a compass that draws upon exhaustive surveys to analyze the IT-driven conditions that point to future trends. The "Introduction" section provides a general view of the future while reviewing the ways IT has changed the world. The "Emerging Tech" section takes a deep dive into the changes happening in each area of technology and makes specific predictions about what to expect. By using IT effectively, you can gain deep insights into your business that can lead to further growth. We hope you will use these tools to assist you in formulating your business strategy.

INTRODUCTION

IT as a Growth Leader

Business growth is led by IT and expanded by AI. The competition to rapidly and continuously improve services for optimal delivery walks hand in hand with the evolution of software, hardware, and data. The breakneck speed of technological innovation in AI is accelerating the growth of business.

INTRODUCTION

01

IT for Transcending Established Boundaries

As IT becomes increasingly linked to the physical world and indispensable as business infrastructure, it has given organizations the power to transcend established boundaries, expand into new industries and realize vertical integration. Meanwhile, IT's growing application to the realm of science is finding solutions to long-standing problems.

INTRODUCTION

02

IT for Searching for New Norms

The rapid permeation of technology is shaking existing value systems and challenging sustainability. Discussions have begun on the search for a new kind of balance that can arbitrate the many conflicts that arise at the point of contact between the world of IT and the existing world. The people who control technology will need to participate in the coming revision of rules.

INTRODUCTION

03

EMERGING TECH

Massive AI will Unlock New Possibilities

There is an intense, ongoing competition to develop new AI models with increasingly massive numbers of parameters, resulting in dramatic improvements in AI's ability to recognize and utilize language and images. A new kind of AI is emerging that will be able to learn and solve problems by itself and be applied to a multiplicity of uses not limited to specific fields.

EMERGING TECH

01

Shape-Shifting IT Infrastructure

IT infrastructure is being reconfigured into a means of creating and expanding businesses that are deeply fused to software. This evolution, coupled with further semiconductor technology development, will give organizations the flexibility to keep pace with change and to accumulate best practices directly linked to real business achievements.

EMERGING TECH

02

Software will Become a Point of Growth

Software is the driving force that grows business and opens new paths forward. It is no longer just a way of getting work done. It is now a moving force that can enlist the involvement of many different stakeholders to realize new ideas and adapt to continuous change. As such, it is a crucible for integrating business knowhow.

EMERGING TECH

03

Renewed Recognition of Data as the Driver

Your new business territory is defined by your ability to use data to grasp and analyze current situations and decide upon strategies. To achieve leadership in business, organizations need to go beyond data-driven marketing and secure the technology to accumulate and utilize detailed, real-time data to fuel continuous improvement and machine learning.

EMERGING TECH

04

Approaches to the Physical World

Bold attempts to infuse the myriad activities of the physical world with the value of IT continue unabated. By expanding the tools that support complicated autonomous and synergistic work, we not only improve the productivity of people, but also accelerate the arrival of a new world that links the virtual to the real and enables continuous, high-speed improvement.

EMERGING TECH

05

Opening the Way to the Unknown Future

AI-based IT will intervene in the remaining areas of our world that have not yet been penetrated by human intelligence, from optimal content delivery plans to the discovery of new materials and the search for the origins of life itself. It will open the way to the future of humankind by changing the way we do R&D and verification, and radically shortening the time it takes to solve problems.

EMERGING TECH

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