To the press concerned:

Participation of 33 scholars from 12 countries

"Lyee International Scientific Joint Research Project" begins

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Catena Corporation
The Institute of Computer Based Software Methodology and Technology

The fundamental technology for software development, "Lyee," has been developed by Mr. Fumio Negoro, President of the Institute of Computer Based Software Methodology and Technology which is a member company of Catena Group. "Lyee" has already been substantially improving the productivity in the Japanese market as an innovative method developed in Japan.

The "Lyee International Scientific Joint Research Project" began under the leadership of Professor Hamido Fujita at the Faculty of Software and Information Science, Iwate Prefectural University. The project is an unprecedented world-wide joint research which 33 scholars from 12 countries take part in, keeping their eyes on "Lyee" and having a desire to further evaluate and study it.

Catena Corporation and the Institute of Computer Based Software Methodology and Technology co-sponsor this project. We are sure that this project will permit diffusion of "Lyee" on a global scale, proposing ultimate solutions to problems that the present software world has.

Purport of the project

1. Background to the project

Until now development methodologies characterized by Data Oriented Approach (DOA) and Object-Oriented Approach (OOA), various packages represented by

Enterprise Resource Planning (ERP), and various tools represented by Computer-Aided Software Engineering (CASE) tool have been introduced to the world of software development. Furthermore, a variety of languages have been developed and used, but none of them cannot be a definitive means to improve development and production of an information system. Even if they seemed to have solved problems on one hand, they created new problems on the other, failing to propose any fundamental solution. As a result, it is said that production of software has been declining from the peak time around 1980. Meanwhile, social demands for software have been on the constant increase, and many companies, while spending an enormous amount of time and money, have a large amount of backlogs, being unable to sufficiently meet the needs for new software. The situation will further worsen if things remain unchanged.

Such doldrums in the software world shadow not only the business world but also the academic world. Efforts have been made to promote analytical approaches by finely dividing development processes and examining ideas proposed for improvement of respective processes, neglecting a comprehensive approach to make an overall change.

However, the scenario function – a universal program structure of "Lyee" derived from Fumio Negoro's original hypothesis – permits simple and flexible understanding of users' requirements and automatic production into the downstream process. Such innovativeness has already made possible overwhelming efficiency -"quick, inexpensive, and skilful"- in the Japanese business market. The innovativeness of "Lyee" has been drawing attention from scholars in Japan and overseas countries as a definitive solution to overcome the present doldrums not only in the business world but in the academic world.

2. Purpose of the project

In order to solve the problems in the present world of software primarily by means of "Lyee" and by the "Lyee theory," the International Scientific Joint Research Project is to promote joint research for (1) study of the Lyee theory, (2) improvement and expansion of development foundations, (3) comparison with existing development methods, (4) expansion of application areas, and (5) development of development tools, thereby establishing a new software development method for the 21st century.

It is scheduled to hold a workshop in 2002 to make an interim report on the study, as well as an international conference in 2003 to make the final report on the study.

Outline of Lyee International Scientific Joint Research Project

1. **Title**

   Lyee International Scientific Joint Research Project

2. **Launching day**

   June 1, 2001

3. **Purpose**

   Promotion of international scientific joint research for establishment and expansion of a new software development method for the 21st century primarily based on the fundamental technology for software development, "Lyee," and the "Lyee theory" in cooperation with scholars in the world

4. **Period**

   Three (3) years

5. **Research paper**

   Twice-a-year periodical research paper
   Presentation of monographs at the joint research workshop and the international conference

6. **Project leader**

   Hamido Fujita,
   professor at Faculty of Software and Information Science, Iwate Prefectural University

7. **Advisory board**

   An advisory board is established to give some advice as necessary on the promotion of the joint research project as a whole.
   Junichi Nishizawa, professor emeritus at Tohoku University andpresident of Iwate Prefectural University
   Shoichi Noguchi, professor emeritus at Tohoku University and president of Sendai Foundation for Applied Information Sciences
   Setsuo Osuga, professor emeritus at Tokyo University and professor at Graduate School of Science and Engineering, Waseda University

8. **Members of research project**

   Thirty-three scholars from 12 countries (as of September 17, 2001) in the world are to join the project.

9. **Joint sponsorship**

   Catena Corporation and the Institute of Computer Based Software Methodology and Technology

The advent of the software age in terms of a system is attributable not to the development of software engineering but to the evolution of hardware development technology. This will be clear if we take a close look at the history of software development from its initial stage to the present status that can be compared to construction of skyscrapers with timber. That is why trial ideas have appeared one after another like mushrooms springing up after rain. However, there was no evolution that would substantially make the software development work itself efficient. While the functional result of the development of a system is highly publicized, problems in the development process are habitually left untouched. Although a pile of contradiction has been produced because of unsatisfactory development technology, opportunities to confront and solve problems boldly have been denied in a global context.

One of the reasons for such a situation is that the unsatisfactory development technology leaves the development state in a black box, causing self-examination itself to be difficult. But I believe that the principal reason is the immaturity of the fundamental recognition of software. Such a social tendency can be reflected also in academic papers and related patents. Especially, as far as I know, there are only a few monographs that refer to the essential problems that should be discussed.

Software is basically a means that captures the actual world, focusing on its phenomena, but its essence is more closely linked to the intentions of users and developers than a mere physical structure, which proves that software has a nature that must be understood in the metaphysical world. Briefly speaking, a viewpoint or a theory that consists in such a world is indispensable for understanding software. Software has been handled under the practice-oriented knowledge system of mathematical engineers, but as far as the mathematical engineering is intended for the knowledge to be shared by the community, such a knowledge system cannot coexist completely with a true nature of software. We must look squarely at this fact.. In other words, the true nature of software needs a viewpoint that consists in even more sophisticated metaphysical world beyond the abstract concept created by those knowledge systems. It is surely a difficult-to-understand world in a sense. However, problems caused by software development technology cannot be solved unless the above-mentioned problem is solved.

Lyee is a theory created on my reflection of the above-mentioned reality. It is different from conventional theories that tend to simply show concepts. The theory rigorously presents an actual process of the development work . I hope that through this theory, the true nature of software will be discussed and the fundamental problems of software will also be examined. Such work will be indispensable for us to get out of the software world in the doldrums, thereby finding what is true in a sound software society.

Comment from project leader
(Hamido Fujita, professor at Iwate Prefectural University)

Coming to know the Lyee theory and its inventor, Mr. Negoro, I have launched this international scientific research project. This challenging project has already been exercising an influence on my study and career. I myself is particularly pleased that such an innovative methodology was established in Japan and is spreading to the rest of the world. This is because although I was born in Canada, I am now a Japanese citizen through naturalization, . I am also proud that the innovative methodology of Lyee has led to the current project launched in Japan. I am sure that Japan will be the founder of a new software science just as she became the founder of the computer hardware technology in the 1970s.

Developing an interest in Lyee, I visited many countries in the world together with Mr. Negoro and met excellent scientists and scholars of software science at major universities. As a result, we could arouse a response in a short period of time and could make an excellent research team. In order to pursue the paradigm of new IT software on the basis of the Lyee theory, a group of people who try to go forward in the same direction after me has been organized.

This project has two enthusiastic targets. Establishing such targets itself has been difficult for other projects conducted in the field of existing software science.

(a) *Launching the first collaborative project that comprehensively approaches the software science*
Many research activities have so far been conducted independently, focusing on specific problem areas. As a result, the necessary project and paradigm to find solutions has tended to be specific as well. In this way, case-by-case software developing methodologies that are indifferent to unification of individual studies have been developed, and a large amount of budget has been appropriated for them.

(b) *Creating a new stream for theory and practice that originally shall not be separated*
In the study of software science, the conceptual assumptions necessary for theoretical foundation have been isolated from the reality in many cases. Therefore, when such theories are applied for development, designed parameters and peripheral solutions are separated from the theory, becoming different from the original design. Such a shift will cause the actual design to go beyond the framework of the original model of the theory, prohibiting practical application, which is the purpose of a theory.

The Lyee theory for software development is the latest methodology created by Mr. Negoro's deep wisdom and wide-ranging operational experience over thirty years. In addition, the methodology made its timely debut at the beginning of the 21st century or the age of IT. The methodology, necessary for the new software development cycle, will open up a new horizon of the software science of the new generation. The new IT software package in demand must be applicable to any environment that is not anticipated at the beginning, entailing a sort of

"intelligence" on a certain level that can change the environment itself, and be safe and secure, permitting progress.　Most software development cycles are lacking in such features, but Lyee has them.　These problems are serious obstacles to conventional software development, hindering the change of course toward development of software that is appropriate for the present and future IT-type business.

The project started in June 2001, and there are 22 small groups called units, which will go into action in 12 countries throughout the world.　The joint research will continue for three years. The first joint workshop will be held in Paris in the autumn of 2002, and an international conference will be held in Kyoto in the autumn of 2003.　We would like to establish the milestone on a global scale for a new software science in which Lyee will be the main concern.

The greatest challenges in the 21st century, I think, will be found in the fields of information communications and energy. The innovation in information communications will especially be the greatest in the history of human culture.   In such an environment, Japan after World War II is still doing what foreign countries do, and creative work that needs original thinking is bearing less fruit.   It is just like being a robot. To take the initiative to other countries , we must change such an attitude.

Although people say that we are in the age of IT, the present IT is in the doldrums, because IT has not penetrated into   the life of ordinary citizens.   What I thought when I established the Faculty of Software and Information Science at Iwate Prefectural University was to allow local people to use computers.

For example, we wanted to meet the needs of a confectioner on a street corner to use a computer for inventory control and give right answers to various questions that would arise after installation of a computer.   Science would begin in this way, I thought.   A university-business alliance will be born when there is business, namely, science is created when products are made. It is unnatural that science comes first before business.

In that sense, the Tohoku district in Japan values the job-site-centered principle highly, which might be taken for granted in the U.S., and the district is considered to be a place of creation. Japanese people have a liking for abstract theories and are apt to think little of the actuality. However, unrealistic things will not last long.   Software engineering seems to be too immature to be called engineering.   To have the roots deep in the ground, software engineering must permit creation of software quickly and inexpensively, allowing the software to be used by ordinary citizens.   I do expect that a new science that will be useful in a practical manner will be created through this project.   Japanese people hesitate to believe what is created in Japan. However, a new theory born in Japan will be believed immediately right after it is re-imported into Japan after making a round-trip in the world.   We must notice new buds growing in Japan more quickly and try to bring them up.   When I made public the electrostatic induction thyristor (SIThy), the first company that contacted me was GE in the U.S.   American people are incessantly watching state-of-the-art technologies.   Such an attitude is the very thing we must learn from the American people.   While there are some excellent pieces of development work in Japan now, we should not neglect them.   It is important to evaluate them correctly and help them develop when they are judged to be worthwhile.

The world of software has just begun.   For example, electronics did not have any accurate definition for sometime from around 1955, but the foundations of electronics were established around that time.   Software engineering is yet to be given a clear definition.   That means, we have a chance now, because a framework of the new science has not been set yet.   It will be too late whenits foundation is consolidated.   The nature of work we do now will determine the trend of software in the world.   In that sense, it is of much significance to promote researches on a global scale through this project.

I am very pleased that the Lyee International Scientific Joint Research Project begain under the guidance of Professor Hamido Fujita at Iwate Prefectural University. Catena Corporation, a monopolistic non-exclusive licensee of Lyee, has been engaged in the diffusion of Lyee, thereby widely contributing to the society. At the present time, which is called the age of bitter competition, executives seriously complain that "the system development cannot catch up with the change in managerial strategy." In such a situation, we are gaining the satisfaction and confidence of the customer in Lyee because it enabled the overwhelming curtailment of the development period and the development cost.

However, we have contributed only to a limited number of enterprises until now. In order to have more people understand Lyee – the fundamental technology for software development which has been cultivated in Japan and which we can take pride in – and allow them to enjoy the enormous merit of Lyee as soon as possible, Catena has been conducting the following four promotion strategies since last year.

First, to provide accurate and useful information on Lyee with the general public through PR activities, thereby facilitating the decision-making of the management of the customers in introducing Lyee to their corporations. Thus, we could be a good help to lower the cost related to their decision-making.

Secondly, to make public the technical details of Lyee, including the details of the patent, and have scholars and engineers understand Lyee. The technology of Lyee can be used for free for anything other than commercial purposes. To that end, we are holding regular seminars on Lyee and providing technical information on Lyee through the Internet. Professor Hotaka at Tokyo University of Technology delivered a series of lectures on Lyee at his university.

Thirdly, to embark on some projects in overseas countries. Since old times, the Japanese have tended to turn a deaf ear to what Japanese people say, and we asked Hosei University Research Institute, California to use Lyee method for a system development. The students who received a training in using Lyee completed a prototype of an achievement control system to be used at a graduate school, making further efforts to add items necessary for practical use and simplify the operation of the system.

Fourthly, to aggressively approach scientific societies and have scholars and researchers in the world joint the study of Lyee. To that end, we are contributing monographs and are explaining Lyee to scientific societies. As a result, scholars and researchers are beginning to understand Lyee.

The current Lyee collaboration project is nothing else but reinforcement of the fourth strategy, in which the third strategy is also substantially concerned. The scholars and researchers who join the project this time have taken notice of the innovativeness and effectiveness of Lyee in actual development and decided to join the project. I hear that this is an unprecedented project in terms of the number of participants from many countries in the world. To cope with the situation, we asked Dr. Junichi Nishizawa, president of Iwate Prefectural University, Dr. Shoichi Noguchi, ex-president of Aizu University, and Dr. Setsuo Osuga, professor at Graduate School of Waseda University, to join us as members of the advisory board of the project.

We are determined to offer best possible support for the success of this project under the guidance of those executive members.

Patents on Lyee

April	1999:	Singapore (Lyee96 Patent No.53192)
August	1999:	New Zealand (Lyee96 Patent No.321670)
October	2000:	U.S.A. (Lyee96 Patent No.6138268)
November	2000:	Japan (Lyee97 Patent No.3133343)
March	2001:	New Zealand (Lyee97 Patent No.335460)
April	2001:	Canada (Lyee96 Patent No. unissued)
July	2001:	South Korea (Lyee96 Patent No.0303946)

List of Lyee International

No.	Name of author	Date of publication	Title of monograph/name of international society
1	Fumio Negoro	Nov. / 00	Principle of Lyee Software
			2000 International Conference on Information Society in the 21st Century (IS2000)
2	Fumio Negoro	July / 01	Intent Operationalisation for Source Code Generation
			World Multiconference on Systemics, Cybernetics and Informatics (SCI2001)
3	Hamido Fujita Fumio Negoro (Joint authorship)	July/01	New Innovation on Software Implementation Methodology for 21st Century - What Software Science can Bring to Natural Language Processing -
			World Multiconference on Systemics, Cybernetics and Informatics (SCI2001)
4	Fumio Negoro Hamido Fuita (Joint authorship)	Aug./01	A Proposal for Intention Engineering
			International Conference on Advances in Infrastructure for Electronic Business, Science and Education on the Internet (SSGRR2001)
5	Fumio Negoro	Aug./01	The Predicate Structure to Represent the Intention for Software
			2nd International Conference on Software Engineering, Artificial Intelligence, Networking & Parallel/Distributed Computing (SNPD'01)
6	Fumio Negoro	Sept./01	A Proposal for Requirement Engineering
			5th East-European Conference on Advances in Databases and Information Systems (ADBIS2001)
7	Fumio Negoro	Oct./01	Method to Determine Software in a Deterministic Manner
			International Conferences on Info-Tech & Info-Net (ICII2001)

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