

BUSINESS PLAN FOR THE INTERNATIONAL NEUROINFORMATICS COORDINATING FACILITY (INCF)

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A. PURPOSE

This Business plan is a companion document to the *Understanding* for the International Neuroinformatics Coordinating Facility (INCF) and the Request For Proposal To Host The Secretariat For The International Neuroinformatics Coordinating Facility (Appendix III). It is intended to assist potential participants in evaluating the process for the establishment and governance of the INCF. The purpose of the INCF is to coordinate and develop international activities in Neuroinformatics. As recommended in the June 2002 final report to the Global Science Forum from the Neuroinformatics Working Group, in order to further and sustain the field of Neuroinformatics, individual nations should continue to support research at the national level, and establish a neuroinformatics node for coordination of national activities and to interact and coordinate international activities. The INCF, with representatives from each participating nation, is to coordinate global activities in Neuroinformatics. Neuroinformatics is a new research area integrating neuroscience with information science/technology aiming at the development of neuroscience data and knowledge bases together with computational models and analytical tools for the sharing, integration and analysis of experimental data, discovery research and the advancement of theories of nervous system function for the purpose of international use under interdisciplinary cooperation.

WHY NEUROINFORMATICS?

- The interface between Neuroscience and Information technology

Improvement of human well-being and the quality of life is one of the most important and urgent targets of modern science. This can be accomplished through understanding human beings and our society and understanding the principal organ that makes us human, the brain, a most complex organ. A key element to successfully understanding the nervous system is the integration of neuroscience with information sciences, making it now possible to utilize the collection of data and knowledge to understand the human nervous system. The field that studies the nervous system, Neuroscience, has responded to this exciting challenge with tremendous exuberance and in great numbers to investigate the functions and development of the nervous system. Using the most sophisticated technologies, neuroscience experimentation now range from studies on the genome to those on brain imaging of behavior in humans and other species, under different functional states, and at all intervening analytical levels. This effort has resulted in large quantities of data, which are ever increasing at higher levels of granularity. The data produced are heterogeneous, coming from different levels of study and modalities of analysis. For example, cellular/molecular studies or whole brain imaging, and the technologies used for collecting these data are different for each approach. In addition, the data may be static or dynamic and at different stages of development across the life span. Current approaches have produced exceedingly large numbers of highly focused research studies. To successfully understand the nervous system, the scientific community should openly share these fractionated data and integrate them into broad new knowledge. To rise to this challenge of integration, and to ensure efficient and maximum

use of these data, it is now necessary to develop and create these shared resources: (i) neuroscience data and knowledge bases; (ii) analytical and modelling tools; and (iii) computational models. This challenge is being met through the merging of neurosciences with information science -- the field of Neuroinformatics.

Our capability to realize these opportunities will set the stage for enhancing the quality of life throughout the world. A direct impact of understanding the nervous system will be the amelioration and prevention of nervous system disorders. In 1996, the Global Burden of Disease Study, conducted by the World Health Organization, the World Bank and Harvard University, predicted, that nervous system disorders would rank first in burden in the 21st century. This impact will be on both the numbers of individuals affected and the burden to family members and society. Indeed, even today, the cost for nervous system disorders are ten times higher than those associated with cancer. The relatively small investment in developing neuroinformatics by the global community will have an enormous impact and payback through the efficiency of understanding the normal working mechanisms of the nervous system and the alterations that occur in nervous system disorders.

B. MISSION

The INCF is to coordinate and develop international activities in neuroinformatics. The INCF, with representatives from each Participant, is to coordinate global activities to guide unifying activities in Neuroinformatics. A signer of the attached *Understanding* has expressed its intention to observe the provisions herein, and is referred to as a Participant.

C. OPERATIONS

The INCF is to operate as both a central and a distributed Facility (Figure 1). The central facility, the Secretariat, is to work internationally through the Neuroinformatics Nodes to coordinate and harmonize national and regional neuroinformatics efforts. It is to promote international collaboration for standards, guidelines, ontology and software tools designed to facilitate interoperability and use on multiple platforms. In addition, the Secretariat is responsible for maintenance and currency of the core infrastructure elements (ontologies, guidelines, databases as required) and other activities as they develop. The Secretariat is to build coalitions among existing efforts, encourage new developments, and provide mechanisms for coordinating separate national investments and forging international agreements.

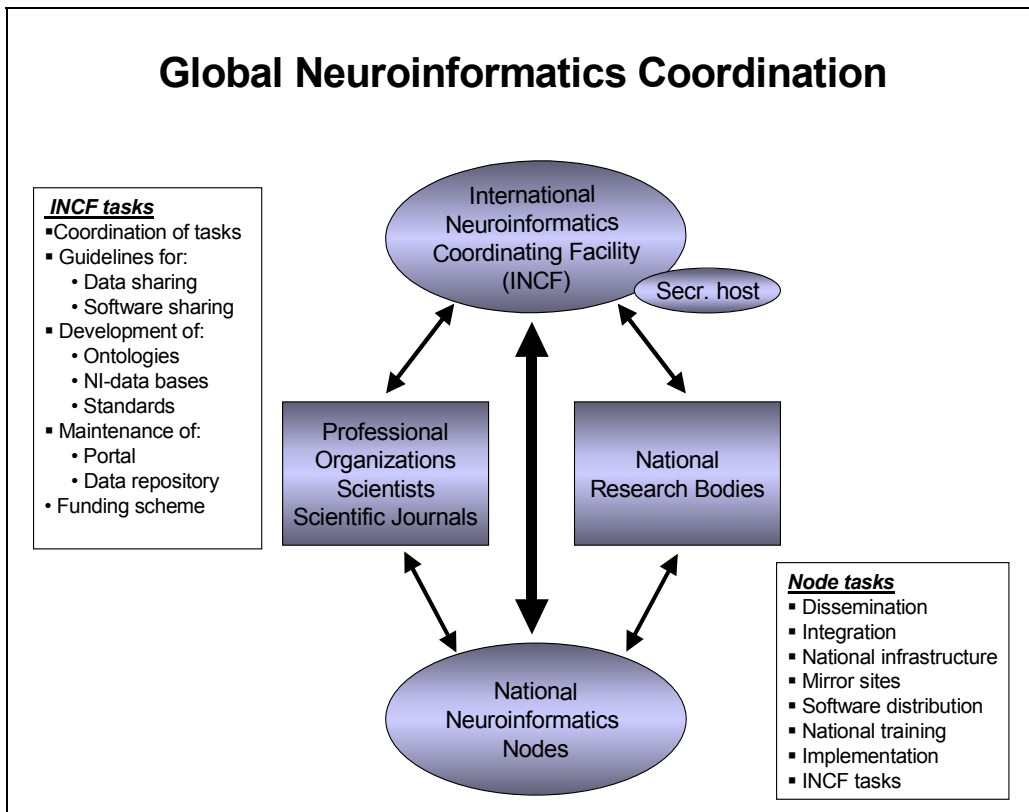


Figure 1:

After the initial five years, funding agreements are to be reviewed, with the option of bringing in other funding sources and modes of funding. Following that period, the INCF may become self-sustaining through direct grants from funding, philanthropic and for-profit organizations. It is recommended that the progress and operations of the Secretariat be reviewed by an independent site visit team and fine-tuned three years following the hiring of the Executive Director. The Participants' representatives on the board are to select appropriate reviewers nominated from professional societies representing the activities of the INCF. Five years following its inception, and every five years thereafter a critical review of the operation and function of the INCF is to be similarly organized. It is expected that these reviews will oversee and guide all aspects of the INCF, determine if the INCF is still appropriate for the field and recommend any needed changes to the continuance of the INCF.

D. NEUROINFORMATICS NODES

The term "Neuroinformatics Node" refers to a facility, or mechanism, or other national arrangement, established to coordinate Neuroinformatics activities within a country and to interface with the INCF. A neuroinformatics node is solely supported by national funds.

Each neuroinformatics node should seek to:

- a) Participate actively in the formulation and implementation of the INCF Work Programs.
- b) Coordinate and facilitate local neuroinformatics research activities at the national level.
- c) Promote the sharing of neuroinformatics data under a common set of standards, consistent with the INCF.
- d) As appropriate, promote the development of neuroinformatics in support of the INCF.
- e) Develop a description of an accepted standard of meta data of the contents and quality of databases, analytical tools and computational models.
- f) Advise on the policy of Intellectual Property Rights and protection of experimental subjects.
- g) Coordinate the management by data base administrators.

E. WORK PROGRAM

The activities of the INCF are organized within a five-year framework (with specific annual programs). The Work Program is organized around several areas or functions, such as:

- a) The development of sets of databases that cover basic and clinical neuroscience from the level of the gene to behavior.
- b) Infrastructure (e.g., portals, communication channels, database federations, grid middleware).
- c) Tools (e.g., simulation environments for computational neuroscience, computational devices, data analysis, data mining, data warehousing, middleware).
- d) Construction and dissemination of models of the nervous system and simulation of neural processes.
- e) Other activities (e.g., development of guidelines, standards, ontologies, dissemination of knowledge, outreach to other communities).
- f) Facilitation of the development of the capacity for building neuroinformatics research (e.g., encouraging development of interdisciplinary training programs).
- g) Coordinate research in neuroinformatics through the development of consensus on strategies and priorities, and facilitate joint funding agreements to carry out specific projects or meet specific goals.
- h) Implementation of the Program in Neuroinformatics (PIN) as a mechanism of support of development of Neuroinformatics (Appendix II).
- i) Develop the capabilities for both transfer of Knowledge and Technology.

F. GOVERNING BOARD

1. Roles and Purpose

The Governing Board is to be the means by which the Participants make collective decisions on all matters relating to the INCF, which are to be put into effect by the INCF Secretariat.

2. Establishment

The Governing Board is to come into existence at the first meeting of the Participants after establishment of the INCF, subject to the provisions of the *Understanding* and accompanying Business Plan. The INCF is to be established once a minimum of five Participants have paid their voluntary contribution and there is seven hundred fifty thousand (750,000) US Dollars in a central account held by the GSF of the Organization for Economic Cooperation and Development (OECD).

3. Composition

The Governing Board is to consist of one representative from each Participant. Participants can have up to two members at each meeting; however, each Participant has one vote. The Executive Director of the INCF is to serve as the Executive Secretary to this Board. The Governing Board is to elect, in its first meeting, a Chairperson and Deputy Chairperson, whose terms are three years. The Chairperson and Deputy Chairperson are to govern the Governing Board.

4. Voting

Participants in good standing are to use the following voting procedures.

- a) Decisions requiring voting can be done by yes-or-no count, unless one member requests a private ballot.
- b) If multiple choices need to be discriminated, the Governing Board should use priority voting.
- c) Decisions requiring voting can only be done when more than 50% of the participants are physically present at the meeting, and the simple majority decision is used.
- d) The INCF Executive Director has no voting right.
- e) In the event of a tie vote, the Chair of the Governing Board is to cast an additional vote to break the tie.

5. Responsibilities

The Governing Board is to:

- a) Select an INCF Secretariat Host using criteria to be established by the signers of this *Understanding*. (See: Appendix III, Request For Proposal To Host The Secretariat For The International Neuroinformatics Coordinating Facility (INCF)).
- b) Establish good governing practices and bylaws for the INCF.
- c) Develop a five-year work program for the INCF.
- d) For each year adopt the Work Program and the Budget, together with a specified program of work and budget for the following two years; the

- Governing Board may make adjustments to the Work Program and the Budget at any time after it has been adopted.
- e) Adjust the scales of voluntary financial contributions suggested in the *Understanding*, using appropriate economic indicators.
 - f) Adopt such rules, regulations and policies as are to be required for the sound management of the INCF and its Work Program, while ensuring adherence to the provisions of any financial rules of the *Understanding* and any new requirements established by the Governing Board.
 - g) Monitor the performance of the INCF Secretariat Host; if necessary, the Governing Board is to replace the INCF Secretariat Host.
 - h) Select an Executive Director; the Governing Board may also replace the Executive Director.
 - i) Provide guidance and direction to the Executive Director on the duties of the position and monitor the Executive Director's performance.
 - j) Approve the staffing level and staffing plan for the INCF Secretariat based on recommendations from the Executive Director.
 - k) Oversee the Work Program and other functions conferred upon it by this *Understanding*.
 - l) Consider any matters pertaining to the INCF or its operations submitted to it by the Executive Director or any Participant.
 - m) Consider at each meeting, any outstanding applications by any organization seeking to sign the *Understanding*.

G. SECRETARIAT

1. Designation

The INCF Secretariat is to consist of the Executive Director and such staff as approved by the Governing Board to implement the Work Program. The INCF central facility, the Secretariat, is to be accommodated in a scientific environment that allows rich professional interactions and relationships with ongoing informatics and neuroscience research efforts. The secretariat is to have free access to relevant libraries and on line journals and meeting facilities and a robust computing infrastructure with high-performance computing capabilities. The Secretariat staff is intended to be cost efficient and should be appropriate to the size, role and responsibilities of the INCF. The structure in this proposal is suggested as an efficient and necessary initial structure and should be appropriately enhanced as progress is attained. It comprises a Director of the Secretariat (who is also the INCF Executive Director), two Assistant Directors, with appropriate expertise in the different areas of neuroinformatics, one Administrative Assistant, one Office Manager, two programmers (one of whom is the webmaster) and two general support staff. The cost of the Secretariat (e.g., office accommodations and overhead expenses) is to be the responsibility of the Secretariat Host except for those provided by the INCF itself. The INCF budget, administered by the Secretariat, is intended for: salaries and operating expenses for Secretariat staff; travel expenses for the Secretariat staff and for members of the advisory groups and other costs, including consultants, as needed, for legal concerns, etc.

2. Accountability

The INCF Secretariat is to be responsible, through the Executive Director to the Governing Board, for the execution of all scientific and administrative activities undertaken to implement the INCF Work Program. The activities of the INCF Secretariat are to be subject to the laws and jurisdictions in force in the country of the INCF Secretariat Host.

3. Financial Responsibilities

The INCF Secretariat is to:

- a) Be the holder of the Central Fund described in the *Understanding*. The INCF cannot commit funds beyond those available in the central fund.
- b) Be responsible for developing financial contracts with Participants specifying how those Participants are to make their voluntary financial contributions to the Central Fund.
- c) Hold in trust, and for the benefit of the Participants, all assets that may accrue to or be acquired for the INCF; and,
- d) Manage finances so that a reserve of at least one year's financial obligations for key personnel is sustained at all times.

4. Transfer of Tasks to the Secretariat Host

Through appropriate financial arrangements between the INCF Secretariat Host and the INCF Secretariat, and with the approval of the Governing Board, some or all of the tasks listed in this Business Plan and the *Understanding*, may be altered by written agreement and transferred to the INCF Secretariat Host. In a similar way the INCF Secretariat Host may transfer tasks to the INCF Secretariat.

H. SECRETARIAT HOST

1. Roles and Purpose

The INCF Secretariat Host is to provide the location, facilities and services agreed to in an arrangement between the Governing Board and the INCF Secretariat Host. The services are to cover staff management, financial management, accountancy, legal assistance, library access, Internet access to published neuroscience, computer science and informatics literature, state-of-the-art IT capabilities, organizing meetings and technical support, etc. The INCF Secretariat Host is to house the INCF Secretariat and manage in accordance with the laws in force in the country of the INCF Secretariat Host. The INCF Secretariat Host is to also obtain or provide legal status for the INCF Secretariat as a not for profit or tax-free organization.

2. Selection

- a) Selection of the INCF Secretariat Host is to be made by the Governing Board through an open process as detailed in the Request For Proposal To Host The International Neuroinformatics Coordinating Facility Secretariat (Appendix III).
- b) Any Participant is entitled to submit a bid for the INCF Secretariat Host; and,

- c) The bidders for the INCF Secretariat Host are to be required to demonstrate their capacity to provide institutional arrangements that conform to the closest extent possible, under their respective domestic laws, with the criteria for the INCF Secretariat Host, the INCF Secretariat and Executive Director, as outlined in the *Understanding* and in the Request For Proposal To Host The International Neuroinformatics Coordinating Facility Secretariat, and that satisfy any other criteria required by the Governing Board.

3. Scope of Authority

Subject to the laws of the jurisdiction in which the INCF Secretariat Host is located:

- a) The INCF Secretariat Host is to be accountable to the Governing Board for all matters pertaining to the INCF, except as otherwise provided in the *Understanding*.
- b) The INCF Secretariat Host is to both house the INCF Secretariat and employ the Executive Director and other INCF staff, or is to facilitate such housing and employment.

The INCF Governing Board is to have oversight of the Executive Director and the relationship between the Secretariat and the Secretariat Host. The day to day operations of the Secretariat and its' relationship with the Secretariat Host are to be managed by the Executive Director of the INCF

4. Reimbursement of Costs

Under the terms of an appropriate financial agreement between the INCF Secretariat Host and the INCF Secretariat expenses and costs reasonably and properly incurred by the INCF Secretariat Host, in supporting the INCF Secretariat, above those costs that the INCF Secretariat Host itself has agreed to provide, may be paid from the funds collected pursuant to the *Understanding*. Neither the INCF Secretariat Host, nor its experts, employees, agents, representatives or contractors, are entitled to commit the Participants to any expenditure.

I. EXECUTIVE DIRECTOR

1. Authority

The Executive Director is to act as the Chief Executive Officer of the INCF and is to have the authority, within limits and guidelines decided by the Governing Board, and, subject to the provisions of the *Understanding*, to enter into contracts and administer funds on behalf of the INCF. The activities of the Executive Director are to be subject to the laws and jurisdictions in force in the country of the INCF Secretariat Host.

2. Accountability

The Executive Director is to be responsible to the Governing Board for the execution of all scientific and administrative activities of the INCF Secretariat. The duties of the office are to be specified in the employment contract of the Executive Director.

3. Responsibilities

The responsibilities of the Executive Director are to:

- a) Oversee the execution of the Work Program.
- b) Recommend to the Governing Board the staffing of the secretariat that is required to carry out the Work Program.
- c) Serve as the Executive Secretary to the Governing Board.
- d) Supervise the work of the INCF Secretariat and its staff, including consultants.
- e) Prepare and submit to the Governing Board, not later than three months before the beginning of each year, a draft annual Work Program and a Budget, together with a Draft Work Program and a Draft Budget for the following two years; and,
- f) Provide the Governing Board with a technically substantive annual report on the Work Program, including financial accounts, tasks achieved, tasks not achieved, and any appropriate explanations, within two months of the closing of the previous calendar year.

J. INTELLECTUAL PROPERTY (IP) AND PROTECTION OF SUBJECTS

The establishment of the INCF has the potential to raise a number of intellectual property issues, including issues of legal protection of database copyrights and downstream commercial use of information accessed through the INCF. However, as the INCF has the potential to promote greater understanding of the benefits of international cooperation in relation to neuroscientific data, it is appropriate to adopt international best practices in these matters.

1. Applicable Law

Nothing in this *Understanding* should be read to alter the scope and application of Intellectual Property Rights and benefit sharing agreements as determined under relevant laws, regulations and international agreements of the Participants.

2. Data Ownership and Access to Data

To the greatest extent possible, the INCF is foreseen as an open-access facility. All users, whether INCF Participants or others, ought to have equal access to data in databases affiliated with or developed by the INCF. This access is to depend on the specific ethical and medico-legal legislation, which regulates in each country the creation and use of information about animals and humans both at the individual and familial levels.

3. IP Rights to Neuroscience Data

The INCF should encourage the free dissemination of neuroscience data and tools, and in particular:

- a) Should not assert any Intellectual Property Rights in the data in databases that are developed by other organizations and that subsequently become affiliated to INCF.

- b) Should seek, to the greatest extent possible, to place in the public domain any data commissioned, created or developed directly by the INCF.
- c) Should respect conditions set by data providers that affiliate their databases to the INCF; and,
- d) Whenever possible when establishing affiliations or linkages with other databases, the INCF should seek to ensure that the data made available are in the public domain, and will not be subject to limitations on its further non-commercial use and dissemination, apart from due attribution.

4. Attribution

The INCF should seek to ensure that the source of data is acknowledged and should request that such attribution be maintained in any subsequent use of the data.

5. Validity of Data

It should be a condition of access to and use of the INCF that users acknowledge that the validity of the data in any databases affiliated with the INCF cannot be assured. The INCF should disclaim responsibility for the accuracy and reliability of the data as well as for the suitability of its application for any particular purpose.

6. IP Rights to Neuroinformatics Tools and Capabilities

The INCF are to claim appropriate Intellectual Property Rights available within applicable national jurisdictions over any tools, such as search engines or other software products that are developed directly by the INCF while carrying out the INCF Work Program. In the case where tools are developed by the participating countries, the Intellectual Property Rights for such tools are to remain within the country where development occurred.

K. PARTICIPANT ACTIVITIES

All Participants invest in related national and international neuroinformatics activities that further the goals of the INCF, provide the voluntary annual fee, maintain a Neuroinformatics Node, and send representatives to the INCF Governing Board and other INCF meetings.

L. VOLUNTARY FINANCIAL SUPPORT OF THE INCF

The direct costs to operate the INCF have been estimated to be 1.2 million United States dollars per year for the Secretariat, not including other in-country national investments and expenses supported by the Secretariat Host (Appendix I). It is in the interest of all Participants that the Facility be built up quickly and cost-efficiently. Thus, initial voluntary contributions should be as timely as possible. The *Understanding* stipulates a scheme of voluntary financial contributions for this initial five-year period related to Research and Development expenditures. This scheme provides a six-tiered system based on the level of Research and Development investment by each country.

M. COST-BENEFIT ANALYSIS

Each Participant due to shared and combined efforts to accomplish the goals of the INCF would realize a direct cost savings. The ability to integrate data will facilitate knowledge and attainment in neuroscience, resulting in substantial economical gain for the society in terms of improved health, and development of the pharmaceutical industry, information technology and robotics. Traditional cost-benefit analyses are often difficult for projects like the INCF as specific economic and quantifiable objectives are not the prime drivers. A global science endeavor inherently has little that can be immediately quantified, because the direct benefits are yet to be discovered during the course of the work. However, detailed cost-benefit analysis by each prospective participant is strongly encouraged, but any detailed evaluation should be based on the incremental costs only, that is, those additional costs that countries would have to meet over and above existing investments into neuroinformatics. The cost benefit of non-duplicative shared responsibility in creating this distributed infrastructure for neuroscience should also be considered.

N. ESTABLISHING THE PROFILE AND IDENTITY OF THE INCF

In its first year, the INCF is to: Develop connections with the node(s) of Participants; hold workshops with advisory groups to develop the priority for the work program and plans to carry them out (Data Access and Database Interoperability, Dictionaries, and metadata standards for databases); formulate a plan for catalyzing the development of Internet connections in all countries and for training individuals to use the INCF and develop Programs in International Neuroinformatics (Appendix II). Efforts are to also be taken to publicize the establishment and disseminate information on the goals and role of the INCF to science and society.

O. OTHER MATTERS

1. Establishment of the INCF

The INCF is to come into existence on July 1, 2005, or sooner once a minimum of five countries has paid their voluntary contribution and there are seven hundred fifty thousand (750,000) US Dollars in a central account held by the GSF of the OECD.

2. Duration

Except as provided below, the INCF is to be set up for an initial five-year period. It is recommended that the progress and operations of the Secretariat be fine-tuned by an independent site visit three years following the hiring of the Executive Director. The Participants representatives on the board are to select appropriate reviewers nominated from professional societies representing the activities of the INCF. Five years following its inception, and every five years thereafter a critical review of the operation and function of the INCF is to be organized. It is expected that these reviews will oversee and guide all aspects of the INCF, determine if the INCF is still appropriate for the field and recommend any needed changes to the continuance of the INCF. The lessons learned are to be used to evaluate the effectiveness of the governance structure and to recommend

any necessary changes or the cessation or continuation of the INCF for an additional five years beyond the initial five years.

3. Termination

The Participants may terminate this INCF *Understanding* at any time by a super majority (two-thirds of the Participants) vote. Upon termination or expiration of this *Understanding*, the INCF Secretariat, acting in accordance with the laws of the jurisdiction in which it is located, is to arrange for the liquidation of the assets of the INCF; property held by the INCF Secretariat for the benefit of the Participants is to be regarded, for this purpose, as assets of the INCF. In the event of such liquidation, the INCF Secretariat, so far as is practicable, is to distribute any assets of the INCF, or the proceeds there from, in proportion to the basic voluntary financial contributions which the Participants have made from the beginning of the operation of the INCF, and for that purpose is to take into account the voluntary contributions of any former Participants.

4. Modifications

The Governing Board may modify the business plan of the INCF as required to carry out the goals and work program of the INCF provided approval is obtained from two-thirds of the total number of participants. This provision may not be altered without unanimous approval of the Participants in good standing. Except where the *Understanding* is explicit.