Xalgorithms Foundation

XALGORITHMS ALLIANCE
ACCESSION AGREEMENT (XAAA)

THIS AGREEMENT IS INVOLVES:

Xalgorithms Foundation (XF), a not-for-profit Canadian federal corporation governed by the laws of Ontario, Canada, and by the Canada Not-for-Profit Corporations Act.
Federal Corporation Corporation Number: 9537775
Business Number: 794071522RC0001

- and -

All other signatories to *Xalgorithms Alliance Accession Agreements*,
who collectively form an unincorporated contractual association named
Xalgorithms Alliance (XA) (Members),
The number of Members is unlimited.
A list of current Members is maintained at the following URL:
https://www.xalgorithms.org

- and -

_____, the undersigned,
who hereby becomes a Party to **Xalgorithms Alliance (XA)** (a Member).

PURPOSE:

Xalgorithms Alliance is comprised of organizational and individual members who collaborate to resource, conceptualize, create, document, deploy, promote, protect and advance free/libre/open source software, protocols, services and use-cases to enable a distributed, general-purpose method for any person to author, publish, discover, fetch, scrutinize, prioritize and optionally automate rules on digital networks and over the Internet with precision, simplicity, scale and speed. The system design is referred to as “the Data With Direction Specification” (DWDS), and its intended emergent phenomenon is referred to as “an Internet of Rules”.

Xalgorithms Foundation Inc. operates globally from Ottawa, Canada. It serves as the organizational home for strategy, project portfolio management, acquisitions and contracts management, administrative coordination and as financial trustee of Xalgorithms Alliance.

THE PARTIES agree as follows:

ARTICLE 1: CATEGORIES OF MEMBERSHIP

Xalgorithms Alliance has the following categories of members, each with a specific role:

1. Implementers

1.1 Strategic Implementer:
- Contributes core annual funding.
- Leads or contributes to sustained business and technical research.
- Excercises three votes on composition of the Foundation Board.
- Eligible to nominate or be nominated for the Foundation Board.

1.2 Experimenting Implementer:
- Provides moderate annual funding.
- Leads or contributes to short/medium-term business and technical research.
- Excercise two votes on composition of the Foundation Board.

2. Researchers & Developers

2.1 Core Developer or Researcher:
- Significant and sustained collaboration in applied or conceptual research.
- Exercise two votes on composition of the Foundation Board.
- Top contributors can nominate or be nominated for the Foundation Board.
- May be paid by monthly retainer or by a daily or hourly fee for work.
- May be reimbursed for direct expenses related to collaboration.

2.2 Ad Hoc Developer or Researcher:
- Occasional collaboration in applied or conceptual research.
- Exercises one vote on composition of the Foundation Board.

3. Donors

3.1 Major Donor:
- Support of research with significant grants or contributions (financial or in-kind).
- Significant donors exercise two votes on composition of the Foundation Board.
- Top donors can nominate or be nominated for the Foundation Board.

3.2. Supporting Donor:
- Support of research with small grants or ad hoc contributions (financial or in-kind).
- Supporting donors exercise one vote on composition of the Foundation Board.
- Top donors can nominate or be nominated for the Foundation Board.

4. External Advisors:

4.1 External Advisor to the Board:
- Significant intellectual and organizational contributions.
- Non-voting advisory role to the Board.

- May attend or speak at Board meetings (except Board-confidential discussions).
- May be reimbursed for direct expenses related to collaboration.

4.2 Xalgorithms Community of Interest:

- Individuals interacting with Xalgorithms Foundation and the wider Xalgorithms Alliance
- Various communication channels
- Constitute an informal learning and knowledge-sharing community.
- Participation is in a volunteer capacity.
- Individuals may be invited to attend or speak at specific meetings
- May be reimbursed for direct expenses related to speaking at Xalgorithms or other events.
- May receive recognition awards.

Additional Notes:

1. Participation in each category is always assumed to reflect the insights, perspectives and views of the individual participant, without any implied representation of any other entity they are involved in, unless such representation is stated explicitly.

2. A Board member must recuse themself from voting on resolutions if a conflict of interest is identified by at least one-third of the Board members.

Xalgorithms Working Groups

Xalgorithms Working Groups convene business, government, academic and/or not-for-profit organizations, as well as informal civil society communities and interested individuals, to solve a category of problems (i.e. “use cases”) though use of the DWDS design for an Internet of Rules. Each Working Group operates for the purposes and within the scope documented in its written charter.

A Working Group under the Xalgorithms Alliance umbrella commences when its charter is supported in a resolution of the Board of Xalgorithms Foundation. A charter includes the following sections:

- Issue to be Addressed
- Outcome to be Pursued
- How the DWDS IoR Helps
- Contact Information
- Annex: Tentative First-Year Workplan

The governance style and expectations for Xalgorithms-hosted Working Groups is primarily modelled upon on the practices of IETF Working Groups:

- https://www.ietf.org/how/wgs/
- https://www.ietf.org/about/participate/tutorials/process/working-group-leadership-training/

Xalgorithms Foundation's bylaws are designed to ensure that it cannot compete against commercial service providers. It is intended that the Foundation should be financed solely through grants and contributions (including member fees), and that it shall not offer fee-for-service contracting. Other entities would provide fee-based software integration and optimization services (optimization of IoR components, technical briefings, system set-up, integration with customer's other systems, bug-fixes, customization, enhancement, and support); and data transformation services (rule transcription, rules inventory management, and usage of rules through an IoR). Anyone involved in the not-for-profit

Xalgorithms Foundation may have concurrent roles in for-profit commercial firms offering such services, however the two roles should be distinguished in that individual's communications.

Any funds autonomously assembled by Working Groups under the Xalgorithms umbrella are managed directly as project funds of the Working Groups themselves. Entities participating in a Xalgorithms-hosted Working Group have the prerogative to set up an account and autonomously manage funds in a manner that is independent of Xalgorithms Foundation. Overall accounting and independent audit of the hosted working groups remains a function of Xalgorithms Foundation, which also retains the prerogative to associate with, or to disassociate from hosting each Working Group.

All Working Groups in common arrange to make an annually negotiated financial contribution to Xalgorithms Foundation so that it can fulfill its core functions, which are to:

- Serve as the responsible technical steward of the DWDS specification and reference implementations, hosting the core DWDS Working Group to design, produce, test, maintain and document the specification and reference implementations, and to ensure that they operate well as a loosely-coupled system to express, publish and fetch rules on the Internet.
- On request, provide administrative support to all Xalgorithms Working Groups;
- On request, provide research and communications support to Xalgorithms Working Groups and their members.

ARTICLE 2: THE FREE/LIBRE/OPEN WAY

2.1 General Principles

Xalgorithms Alliance relationships and operations are simultaneously aligned with both the demand-side perspective of The Free Software Definition (i.e. user freedoms), and the supply-side perspective of The Open Source Software Definition (i.e. developer principles), as summarized in Table 1.

The value proposition for participation in free/libre/open works has three facets: augment benefits; manage risk; and reduce costs. Efficient and effective projects leverage pragmatic capabilities and distribute cost and risk among multiple organizations and individuals, as each tailors their participation to complement their own priorities and objectives.

2.3 Contributor Agreement

The parties wish to ensure that contributions to Xalgorithms Alliance projects have acceptable licensing terms without requiring intellectual rights assignment. This section is adapted from the *Fedora Project Contributor Agreement, Version 2021-05-04*, and relies on its definitions. This text may be updated from time to time, as the original source evolves: https://docs.fedoraproject.org/en-US/legal/fpca/

2.3.1 Consistency of Intellectual Rights Title

Unless otherwise agreed in writing, each Contributor of works to Xalgorithms Alliance projects retains ownership of their respective title to any copyright, moral rights, industrial design, patent or trademark assets.

Table 1 **Complementary Perspectives that Jointly Define the *Free/Libre/Open Way (FLOW)* in Software**	
<u>Demand-Side Perspective</u>: ***The Free Software Definition*** (Free Software Foundation, 1996) https://gnu.org/philosophy/free-sw.html	**<u>Supply-Side Perspective</u>:** ***The Open Source Software Definition*** (Open Source Initiative, 1998) http://opensource.org/osd-annotated
A computer program is distributed free/libre when *<u>anyone who obtains it</u>* retains the following freedoms: Freedom 0: Freedom to run the program for any purpose. Freedom 1: Freedom to study how the program works, and adapt it to one's needs. Unencumbered access to the source code is a precondition for this. Freedom 2: Freedom to copy the program and to redistribute copies. Freedom 3: Freedom to improve the program, and release any modified versions. Unencumbered access to the source code is a precondition for this.	A computer program is distributed open source when *<u>anyone who distributes it</u>* abides by the following principles: Permit free redistribution Publish source code Welcome derivative works Respect integrity of author's source code Ensure the license is technology-neutral Do not discriminate against persons or groups Do not discriminate against fields of endeavour Do not link with non-disclosure agreements Do not tie the license to a particular product Do not restrict other software's terms and conditions

2.3.2 Intellectual Rights Permission Required for All Contributions

If the Committer is not the intellectual rights holder of a given Contribution that the Committer wishes to Submit to Xalgorithms Foundation (for example, if the Committer's employer or university holds copyright in it), it is the Committer's responsibility to first obtain authorization from the copyright holder and to Submit the Contribution under the terms of this Agreement on behalf of, or otherwise with the permission of, that copyright holder. One form of such authorization is for the copyright holder to place, or permit the Committer to place, an Acceptable License for Xalgorithms Foundation on the Contribution.

2.3.3 Licensed Contributions

If the Committer's Contribution is Licensed, the Contribution will be governed by the terms under which it has been licensed.

2.3.3. Default Licensing of Unlicensed Contributions

If the Committer Submits an Unlicensed Contribution to Xalgorithms Foundation, the license to the Xalgorithms Alliance Community for that Contribution shall be one of the Current Default Licenses, as determined by Xalgorithms Foundation. The following default licenses are used for the distribution of XA works:

Apache 2.0 or a more recent version: https://www.apache.org/licenses/LICENSE-2.0
AGPL 3.0 or a more recent version: https://www.gnu.org/licenses/agpl-3.0.en.html
LGPL 3.0 or a more recent version: https://www.gnu.org/licenses/lgpl.html
CC-by 4.0 or a more recent version: https://creativecommons.org/licenses/by/4.0/

On an ad hoc basis, other free/libre/open source licenses may, by public announcement, be used by Xalgorithms Foundation to align with the participation requirements other organizations, to meet particular requirements not accommodated in the above licenses.

Xalgorithms Foundation may also, by public announcement, subsequently designate an additional or alternative default license for a given category of Contribution (a "Later Default License"). A Later Default License shall be chosen from the appropriate categorical sublist of Acceptable Licenses For Xalgorithms Alliance.

Once a Later Default License has been designated, the Committer's Unlicensed Contribution shall also be licensed to the Xalgorithms Alliance under that Later Default License. Such designation shall not affect the continuing applicability of the Current Default License to the Committer's Contribution.

The Committer consents to having Xalgorithms Foundation provide reasonable notice of licensing of the Committer's Contribution under one or more of Current Default Licenses (and, if applicable, a Later Default License) in a manner determined by Xalgorithms Foundation.

2.3.4 Public Domain Works

Sections 2.3.1 through 2.3.3 of this Agreement do not apply to any Contribution to the extent that it is a work designated as Public Domain within its primary source jurisdiction.

2.3.5. Acceptance

Each Member of Xalgorithms Alliance must signify assent to the terms of this Agreement through specific electronic means established by Xalgorithms Foundation.

The default method is to send a copy of this Agreement, bearing a digital or written signature indicating the individual's or organization's acceptance of its terms, by email to info@xalgorithms.org or by postal mail to:

> Xalgorithms Foundation
> 50 Hines Road, Suite 240
> Ottawa, Ontario, Canada K2K 2M5

ARTICLE 3:
MANAGEMENT OF CONFIDENTIAL INFORMATION AND PRIVATE INFORMATION

3.1 Definitions

Communication by Parties to this Agreement can sometimes include the exchange of information that is deemed confidential ("Confidential Information") and/or private ("Private Information").

(a) Confidential Information (e.g. regarding opportunities, strategies, plans, improvements, direct extensions, and/or derivative ideas, products or services) derives its actual or potential market value from not being generally known or readily ascertainable within a given context. Confidential Information *loses its confidential status* if it becomes generally available to the public, or if it is required to be disclosed by law or by the applicable regulations or policies of any regulatory agency of a competent jurisdiction or any securities or stock exchange.

(b) Private Information is information which has been provided for specific purposes by one or more individuals and which they can reasonably expect will not be made public. Private Information *retains its private status* even if it becomes generally available to the public, or if it is required to be disclosed by law or by the applicable regulations or policies of any regulatory agency of a competent jurisdiction or any securities or stock exchange.

3.2 Responsibilities

(a) No information that has been identified as Confidential Information or Private Information should be included in communications within the context of Xalgorithms Alliance business under this Agreement other than within the expressed restrictions. All participants in such communications shall be informed that the revealed information is Confidential Information or Private Information, in which cases its disclosure must be limited to those amongst their colleagues, employees, employers, partners, agents, advisors, affiliates, representatives or stakeholders who need to know the Confidential Information or Private Information in connection with the described purposes or contexts.

(b) No part of this Agreement or its Schedules contains Confidential Information or Private Information.

ARTICLE 4: RENEWAL, WITHDRAWAL, TERMINATION, ASSIGNMENT

4.1 Renewal

Members will be notified three months prior to the anniversary date of their Accession Agreement that they can renew with a payment prior to that date, or they may passively let their Membership lapse. A Membership that has lapsed may be reinstated, from the date of a new Accession Agreement.

4.2 Withdrawal

Prior to the anniversary date, any Member may withdraw from the Xalgorithms Alliance and terminate future payments.

A withdrawing Member is not entitled to the return of any cash, goods or entitlements previously contributed, unless otherwise agreed in writing with Xalgorithms Foundation. Nevertheless, taking into account particular circumstances, the Board of Xalgorithms Foundation may elect to refund all or part of the withdrawing Member's contributions in cash or in kind.

4.3 Termination

Based on a vote of 3/5ths (60%), the Xalgorithms Foundation Board may unilaterally terminate any Member under this Alliance Agreement.

(a) Termination of Membership shall be accompanied by (i) a letter of explanation signed by the Executive Director of Xalgorithms Foundation; and, (ii) within 30 days, the prorated reimbursement of funds based upon calendar time remaining prior to the anniversary date of the Alliance Agreement. The letter of explanation will be treated as confidential by Xalgorithms Foundation, except to the extent that the terminated party provides public access to any part of the letter.

(b) In the event of a termination, the Parties shall endeavour to constrain any consequent disruptions to within the scope of their respective operations and teams, balancing their mutual obligations for transparency with a commitment to overall business courtesy and diplomacy.

4.4 Permanent Transfer or Temporary Assignment

Rights or obligations established under this Agreement may be permanently transferred or temporarily assigned to another Person only with a written and duly signed agreement between a representative of Xalgorithms Foundation and the Transferee/Assignee, whereupon the Transferor/Assignor will no longer be a Party to this Agreement.

4.5 Obligations that Survive Withdrawal, Termination, Transfer or Assignment

Upon the lapsing, withdrawal, termination, transfer or assignment of an Accession Agreement:

(a) Even if a Party is deemed no longer a Party to this Agreement, nevertheless certain other formal business commitments relating to Xalgorithms Alliance and undertaken whilst party to this Agreement would survive (e.g. software licenses, other contracts, termination obligations).

(b) Confidential Information of, and relating to, the former Parties to an Accession Agreement will persist until 2 years after the termination of this Agreement. Confidential Information more than 2 years old from the date of the most recent interaction between the Parties shall no longer be considered confidential in an contractual sense.

(c) Private Information shall remain restricted indefinitely.

ARTICLE 5: CERTAIN RULES OF INTERPRETATION

5.1 Jurisdiction

In this Agreement:

(a) Currency - Unless otherwise specified, all financial amounts are denominated in the Canadian dollar.

(b) Governing Law - This Agreement is a contract made under, governed by and construed in accordance with, the laws of the Province of Ontario and the federal laws of Canada applicable in the Province of Ontario.

(c) Severability – Should any provision of this Agreement become invalid, illegal or unenforceable, that provision does not affect the validity of the remaining provisions of the Agreement. The Parties will promptly negotiate a valid and practicable provision that on the *cy près* principle, fulfills the business purpose of the original provision.

5.2 Notices

(a) Any notice, consent or approval required or permitted to be given in connection with this Agreement (a “Notice”) must be in writing and is sufficiently given if delivered (whether in person, by courier service or other personal method of delivery), or if transmitted by e-mail or physical address, at the physical address or e-mail address of the applicable Party contained in the Registry of Members. A Notice issued to a physical address or an email shall be reciprocated by an acknowledgement of receipt by the addressee, except in extenuating circumstances.

(b) Any Notice delivered or transmitted to a Party as provided above is deemed to have been given and received on the day it is delivered or transmitted if it is delivered or transmitted on a business day prior to 5:00 pm. local time in the place of delivery or receipt. If the Notice is delivered or transmitted after 5:00 pm. local time or if such day is not a business day, then the Notice is deemed to have been given and received on the next business day. Any party may, from time to time, change its address by giving Notice to the other Parties in accordance with the provisions of this Section.

5.3 Amendment

(a) An amendment of this Agreement is binding on all parties without further action if both of the following steps are completed:

   i. A written resolution detailing the amendment is approved by at least 60% of the Xalgorithms Foundation Board of Directors; and also,

   ii. Written acknowledgement or acceptance of the amendment is received from the email listed on the currently active signed Agreement, or by some other easily accessible electronic method designated by the Board, from at least 60% of all current signatories of Xalgorithms Alliance Accession Agreements, who shall be deemed to represent Xalgorithms Alliance.

(b) Forthwith following the effective date of an amendment to the Agreement, Xalgorithms Foundation will publish on its website at http://www.xalgorithms.org both the new copy of the Agreement, and a “change control” copy in which all amendments can be readily seen.

(c) If any amendment to this Agreement lacks the written consent of some Parties, the Executive Director of Xalgorithms Foundation will forthwith send a notice to the email listed on the currently active signed Agreement including the URL(s) to provide both the new copy of the Agreement, and a “change control” copy in which all amendments can be readily seen.

ARTICLE 6: ACCEPTANCE

The parties may execute this Agreement in counterparts and this Agreement may be executed and delivered by electronic means, and all such counterparts together constitute one composite agreement.

6. Signatures

_____

Acceptance Date

_____

Signature

_____

Name

_____

Organization Name (if applicable)

_____

Official Contact Email “FirstName LastName” <email>

_____ _____

Ratification Date (DD, MM, YYYY) Joseph Potvin, Executive Director

Xalgorithms Foundation
50 Hines Road, Suite 240
Ottawa, ON, Canada K2K 2M5

SCHEDULE A

XALGORITHMS ALLIANCE FUNDING CONTRIBUTIONS

Categories

Xalgorithms Foundation is resourced solely through financial and in-kind grants and contributions in five categories:

- **Strategic Implementers** make a CAD$100,000 annual contribution, and they also arrange for an equivalent in-kind commitment to joint research and development.
- **Experimenting Implementers** make a CAD$10,000 annual contribution, and they also arrange for an equivalent in-kind commitment to joint research and development.
- **Developers & Researchers** make a CAD$500 annual contribution towards member services that directly or indirectly assist the participatory nature of Xalgorithms Alliance research and development.
- **R&D Donors** provide grants and contributions, in cash and/or in-kind to support joint research and development, either to Xalgorithms Foundation or to any of the active Working Groups.
- **Board Members** and **External Advisors** provide in-kind consultative assistance towards the development and deployment of an Internet of Rules.

Payment Method

Transfers can be made via direct deposit to:

Xalgorithms Foundation,
50 Hines Road, Suite 240,
Ottawa, Canada K2K 2M5

RBC Bank Account #1079433
Transit #00006, Institution #003,

Wire transfer: SWIFT #ROYCCAT2

Alternative payment methods can be arranged.

SCHEDULE B

MEMBER INFORMATION OBTAINED WITH EACH ACCESSION AGREEMENT

This information is not Confidential or Private, and will be available on the Foundation's website:

- Date of Accession to the "Xalgorithms Alliance Accession Agreement"
- Acceptance of the provisions of the Accession Agreement
- Name of Individual (individually or on behalf of an entity)
- Entity Name (if the Member is an entity)
- Legal address

This information will be managed as Private by default, and Members will have the option to reveal it:

- Contact information for communications between the member and Xalgorithms Foundation

SCHEDULE C

XALGORITHMS ALLIANCE MISSION STATEMENT

2024-05-10

Members of Xalgorithms Alliance mutually assist each other and Xalgorithms Foundation in collaborative design and implementation of the Data With Direction Specification (DWDS) and a suite of operational reference implementations under 100% free/libre/open licensing and methods, to enable an emergent "Internet of Rules".

The purpose of an Internet of Rules is to enable a distributed, general purpose method for any person to author, publish, discover, fetch, scrutinize, prioritize and optionally automate normative assertions (rules) on digital networks with precision, simplicity, scale, volume and speed. This would enable context-senstitive event-triggered transmission by rule-makers (individuals, organizations) of concise, current, personalized information about normative data (MUST, MAY and SHOULD, and their synonyms and negatives) to rule-takers (individuals, organizations and/or machines) through their diverse applications and platforms at a high level of granularity when they are ‘in effect’ for given dates/times and jurisdictions, are ‘applicable’ to the categories for product/service and industry, and ‘invoked’ by particular circumstances.

DWDS is designed for expressing any type of rule in natural but grammatically structured language, to simplify human-readability and comprehension of rules in any language while also enabling computer-executable operation on any computing platform or application.

The value of an IoR to each user increases with greater IoR adoption across the entire user base.

- Greater performance by each is more attainable the more is used by all;
- Distribution of effort for economies of scale (lower per-user cost; spread cost of innovation);
- Joint benefits of a generic system usable through any platform (write once, run anywhere);
- Free/libre/open licensing of the core IoR components facilitates ubiquitous deployment and use.

SCHEDULE D

A DRAFT TEMPLATE FOR A WORKING GROUP'S FIRST-YEAR WORKPLAN

Statement of Work and Schedule

Following is a tentative one-year project schedule oriented to the delivery of interim results and management check-points. This serves as a guide only, to be updated as determined by participants.

- **Month 1:**
  - Set objectives and frame the stakeholder relationships.
  - Set up a 'developer environment'.
  - Arrange R&D collaboration.
  - Select an initial sample of rules for testing, from simple to complicated.
  - Design structured test protocols for system performance.
  - Design test protocol service to validate rule conformance.
  - Adapt multilingual, accessible, end-user interface.
  - Arrange for ongoing documentation and task management.
- **Months 2-3-4:**
  - Test scenarios with RuleMaker, RuleReserve, RuleTaker.
  - Increase rule complexity, test accuracy and for speed.
  - Refine method for validating rule conformance.
  - Prepare a risk management model addressing impacts of errors.
  - Prepare, present 1st interim report to stakeholders.
- **Months 5-6-7:**
  - Broaden collaboration on rules-as-data expression and validation.
  - Roll out and support version 1.0 of the online service.
  - Publish v1.0 documentation (technical, financial, legal).
  - Broaden consultations (technical, financial, legal).
  - Create management/financial models for proliferation.
  - Prepare and present 2nd interim report to stakeholders.
- **Months 8-9-10-11:**
  - Broaden collaboration on rule expression and validation.
  - Iterative 'Plan-Do-Check-Adjust' Cycles:
    - Complications, exceptions, anomalies.
    - Dependencies: forward/backward-chained; lookups.
  - Commence scheduled quarterly version updates.
  - Publish technical, financial, legal documentation.
  - Prepare and present 3rd interim report to stakeholders.
- **Month 12:**
  - Arms-length study of stakeholder/community views.
  - Prepare, discuss, refine follow-on workplan.
  - Assess future training demand and write training plan.
  - Assess future tech support demand, write support plan.
  - Prepare and present Annual Report to stakeholders.

SCHEDULE E

A XALGORITHMS RISK MANAGEMENT MODEL

Risk management across a decentralized network such as DWDS must facilitate the exercise of due diligence by autonomous administrators, and assure the integrity of the networked system as a whole.

A comprehensive risk management approach addresses operational, systemic and residual risk:

- *Operational risk* concerns the degree of assurance, integrity (freedom from tampering), privacy, confidentiality, auditability, reliability (freedom from 'bugs' in code, design and architecture), trustworthiness, authorization controls and availability, data/metadata ownership/access/holding/ persistence, and issue-response methodology/performance.
- *Systemic risk* has to do with instrinsic system design, adequate maintenance of system components, and auditable conformance with both Xalgorithms' own documentation, and any formal standards that are required or referenced. Intrinsic security at the level of system design is paramount. For example, by narrowly constaining RuleData, its potential attack surface is delibrately minimized. Also, deployment of the reference implementations for very diverse contexts and solutions attracts peer review from many perspectives, while it also encouraging 'whole system composability'.
- *Residual Risk* management requires more than a routine percentage increase in liability coverage. The greatest risks are those not known. C.S. Holling has commented: *"Experience shapes concepts; concepts, being incomplete, eventually produce surprise; and surprise accumulates to force the development of those concepts. This sequence is qualitative and discontinuous. The longer one view is held beyond its time, the greater the surprise and the resultant adjustment."* There is not one future to plan for, but a range of trajectories. To internalize surprise, a creative pro-active approach it taken to residual risk through scenario envisioning and contingency planning.

Xalgorithms Alliance maintains two business service models for risk management, for refinement and adapation by participating entities in the risk management industry.

(a) XalgoVerify: Due Diligence Regarding Third-Party Rules

XalgoVerify is a business service model for rule integrity validation service which can be offered either commercially or on a not-for-profit basis. When operational, it would provide rule orginators and their user communities a means to manage risk through due diligence regarding the integrity of the rules deployed.

Such a service would provide users of any given rule — for example buyers and sellers of licensed market data — a way to validate integrity when rules are sourced from third parties. The service can be offered with formal certification to a management standard, or with audited conformance to the principles and guidelines of such a standard, but without certification.

The XalgoVerify template includes evaluation of whether the documentation of a rule is an accurate and comprehensible statement of what the rule is supposed to do; and that the rule indeed does precisely and only what is claimed. XalgoVerify services may also include automated testing for compliance with external requirements, such as specific regulations or standards. The Xalgo Verify service package would include automated technical testing of rules similar in operation to the Comprehensive R Archive Network (CRAN).

(b) XalgoIndemnify: Comprehensive Risk Management and Risk Tolerance

XalgoIndemnify is a business service model for providing optional financial risk management to organizations that implement and/or use DWDS reference implementations, or derivative versions of them, for genuine market operations.

XalgoIndemnify will describe policies to cover some or all aspects of *operational and systemic risk*, and would also provide guidelines to facilitate audits of system elements, from the logic down to line-by-line tests. In communication with insurance firms, a set of group packages will be designed to bundle defined benefits for scheduled preventative maintenance on deployed components plus 24X7 issue-management, emergency response and business continuity support, along with warranty and indemnity coverage at various scales of financial risk. Preventative maintenance benefits would be structured in a manner analogous to dental care benefits: regular check-ups and routine maintenance. Group insurance could be structured similarly to no-fault automobile insurance, including:

- Warranty and indemnification for defined classes of errors & omissions;
- Event-response and service continuity during adverse events;
- Specialists under pre-priced framework agreements for emergency response;
- A preventative maintenance package with defined benefits;
- Efficient audited-claims processing;
- Continuity of support during major financial crises or austerity.