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Executive Summary

The GS1 Innovation Network was launched in February 2015. Its mission:

• To identify the most important business challenges and opportunities, technology innovations and global trends that might be valuable and/or disruptive for industry, humanity and GS1 in the future

• To act quickly to explore and test important topics

• To advise GS1 and its industry on new standards, services and solutions that should be developed

GS1 created the Innovation Network based on the model and legal structure of EPCglobal and its Auto-ID Labs (Labs), major contributors to GS1 standards development in past years.

People with diverse perspectives and experiences are contributing in all parts of the Network, including a new brainstorming platform called the InZone; Incubators for exploring and testing concepts; and the Innovation Board where senior leaders provide ideas, guidance and prioritisation of investments.

The InZone, an open collaboration platform, was introduced during the 2015 GS1 Global Forum as a place to brainstorm ideas and recommend action on those most promising. To date, nearly 450 participants have engaged in 70 discussions and planning sessions using the InZone.

Incubators are project teams that focus on the further development of promising concepts. They use tools such as workshops, pilots, prototypes, hackathons and startup accelerators to explore the viability of a concept. The major outcome from an Incubator is an Insights Report that presents forward-looking analysis and recommendations.

Two Incubators have already been launched—“The Future of Identification” and “Digital Coupons.”

The goal of The Future of Identification Incubator is to provide a roadmap for the globally unique identification of everything. In May, the Incubator hosted its first workshop, with 36 participants focusing on the future consumer purchasing experience. Several areas of opportunity were identified. The second workshop is planned for September 2015 and a draft of the Incubator’s Insights Report will follow in December.

The Digital Coupons Incubator is exploring options for a global interoperable digital couponing framework. The Incubator has established a pilot in the United Kingdom, intended to prove commercial and technical viability, and demonstrate the applicability and effectiveness of existing and future standards. Results are expected in July 2015. The Incubator’s Insights Report is planned for publication in October 2015.

Short-term measures of success for the Network may be as straightforward as levels of participation and ideas generated. However, in the long term, the ultimate measure of success will be the new standards, services and solutions that were first explored within the Innovation Network, and ultimately used to improve the way the world works and lives.
1 Introduction

Given that the Network has only recently started, this inaugural issue of the Roadmap provides a summary of the motivation, history and plans for the Network. We also document below some promising, initial outcomes. Subsequent issues will be published annually, and will summarise a substantially richer set of accomplishments and the path to the future implied by those efforts.

2 Mission

The Innovation Network’s mission is to anticipate the solutions that will be needed by industry and people, allowing GS1 to develop strategic, proactive plans and make practical investments. The Network will provide recommendations, prototypes and draft specifications to help GS1 more quickly develop the standards, services and solutions needed to meet industry and consumer needs.

Opportunities identified by the Network—whether organic or disruptive in nature—will be explored with deliberate action. The focus is expected to be on challenges requiring global solutions and interoperability, looking three or more years into the future.
3 History

Since the late 1990s, a major contributor to GS1 standards development has been EPCglobal and its Auto-ID Labs where pre-standards research and testing have been conducted. Examples of EPCglobal innovation are the Electronic Product Code (EPC)-enabled Radio Frequency Identification (RFID) standards that are now the backbone of item-level product tagging and vastly improved inventory accuracy. The Labs also developed and explored the concept of track and trace systems, which today has resulted in growing industry interest in the resulting GS1 EPCIS standard.

Yet, GS1 was late to recognise the emergence of e-commerce and, as a result, has had to catch-up to address the needs of Internet-based retailers.

In May 2014, the creation of the GS1 Innovation Network was approved by the GS1 General Assembly, with the express purpose of providing an open, neutral environment for identifying, exploring and advising GS1 on future business challenges and potential solutions.

To establish the Innovation Network, GS1 expanded the technological scope of the EPCglobal model. After months of preparation, the Innovation Network was launched at the 2015 GS1 Global Forum and is decisively moving forward to build a forum where creative minds gather, identify and actively explore the most important business opportunities and technological advances needed to serve the GS1 community of industries and consumers in the future.

The Network positions GS1 to be “out-in-front” from a planning perspective and across a wide range of future business problems and technologies. For example, understanding a disruptive technology well before it disrupts an industry will give GS1 an opportunity to proactively develop a strategy for exploring and potentially adopting it.

Since many business challenges today are global in nature, the Network gives industry and GS1 Member Organisations (MOs) the opportunity to explore solutions from a global perspective, rather than a local vantage point. The Network also provides companies with a safe, neutral place to collaborate and conduct research on industry-wide, emerging challenges.

The Innovation Network is working to ensure that GS1 is aware of and fully prepared to create the next big things needed by industry.

Neutrality Fostering “Coopetition”

GS1 has created the Innovation Network as a safe place for competitors within industries to participate without concern. In addition to participating voluntarily, discussions of pricing, allocation of customers or products, boycotts, refusals to deal and market share are strictly off-limits. Throughout the process, all participants remain free to make independent, competitive decisions without fear or favour.
Network Components

Success for the Innovation Network is about taking a creative, agile approach to exploring possibilities and taking an idea to a decision point.

To this end, the Network is designed as an open-communication environment where taking risks is valued.

To be successful, GS1 is engaging people who are open-minded and committed to exploring ideas that initially may sound out of the norm, but could evolve into something important for organisations over time. This is the innovative spirit GS1 intends to attract and build within the Network.

Key components of the Innovation Network include:

- **Diverse views and leadership** from business and technology
- **InZone** for brainstorming
- **Incubators** for exploration and testing
- **Actionable products** provided to GS1 for development

Diverse Views and Leadership

To be successful, the Innovation Network must leverage the vision of top GS1 and external thought leaders in a collaborative environment that bridges the divide between technology and business.

**GS1 and Member Organisations:** With 40 years of experience developing standards for more than a million companies and organisations worldwide, GS1 has a talent pool in its Global Office and 112 GS1 MOs serving 150 countries.

**Business and technology experts:** The Network engages with experts from its member companies as well as companies that do not typically work with GS1, including their research centres and marketing organisations.

**External experts:** The Network infuses new ideas by calling for the expertise of people from consulting groups and other standards organisations.

**Academia:** The Network leverages the work of the Auto-ID Labs, their parent institutions and other universities to explore technology concepts, support pilots, conduct targeted research and share results.

**GS1 Innovation Board:** Senior business and technology visionaries provide guidance, governance and prioritisation of investments and are accountable for the Innovation Network roadmap to the future. The Board may suggest partnerships that GS1 should forge to bring complete solutions to market.
As of June 2015, the Innovation Board members include:

**Chairman: Sanjay Sarma**, Professor, Mechanical Engineering, Massachusetts Institute of Technology

**President: Steve Bratt**, Chief Technology Officer, President, Standards Development and EPCglobal Inc., GS1 Global Office

**Members:**
- **Ahmed El Kalla**, CEO, GS1 Egypt
- **Elgar Fleisch**, Professor of Information and Technology Management, ETH Zurich and University of St. Gallen
- **Cory Gundberg**, VP Information Systems Division, U.S. Customer Planning & Analysis, Walmart Stores, Inc.
- **Bernie Hogan**, Senior Vice President, Emerging Capabilities and Industries, GS1 US
- **Marina Kotsianas**, CEO, Artia Strategies (University of Southern California)
- **Jörg Pretzel**, CEO, GS1 Germany
- **Rob Rekrutiak**, Product Lead-Google Shopping Catalogs and Data, Google
- **Chris Resweber**, Senior Vice President, Corporate Communications and Public Affairs, The J.M. Smucker Company

The Innovation Network’s collaboration platform is the major tool used by Network participants to brainstorm new ideas and post outputs from Incubator activities.

To date, nearly 450 participants from GS1 MOs, the Global Standards Management Process (GSMP) community, Auto-ID Labs and guests have engaged in 70 discussions, ideation and planning sessions using the InZone.
InZone

In the Network’s InZone, participants—industry, GS1 MOs and external experts—identify, discuss and rate the importance of a broad range of business challenges and the potential relevance of innovative solutions.

The InZone was introduced during the 2015 GS1 Global Forum. There, nearly 100 participants from 48 countries “test-drove” the platform by brainstorming ideas and concepts, and then supported action on those most promising. To date, more than 450 people are registered and participating in 70 different discussions.

Incubators

Incubators are action-oriented groups that focus on the further development of concepts that have garnered sufficient interest and commitment from InZone discussions, Innovation Board guidance or GS1 requests.

Incubators have clearly defined business problems and solution ideas, leadership and participants, action plans, deliverables, and the needed resourcing from GS1 and industry.

Teams move quickly (in one to six months) through exploration, testing, next steps and recommendations. Various innovation tactics may be employed, to take targeted concepts to the next level, or allow them to fail fast (with lessons learned).

Proven to be a consistently productive tactic, workshops are focused meetings of invited experts who share ideas, further analyse specific topics and progress. Proposals for discussion are submitted by internal and external experts and conclusions from each workshop are fed into an Insights Report, which may be the catalyst for further work or recommendations to GS1.

Other tools well suited to the Incubator—including pilots, prototypes, hackathons and startup accelerators—may be used to further explore the viability of the Incubator’s targeted concept. These may include hardware-, software- and knowledge-based activities that centre on rapid testing and demonstration, while also building community and seeking investment around a targeted concept.

For example, the Incubator team may engage the Auto-ID Labs, other universities and outside groups to conduct a pilot or create a prototype that tests the feasibility of the proposed solution.

The Incubator may also host a hackathon where developers are invited to intensively collaborate (in a very short period of time) to develop applications aimed to address the problems identified by the Incubator.

In fact, GS1 Switzerland, the Auto-ID Lab at ETH Zurich and the Innovation Network team organised a “Future of Shopping” event at HackZurich in October 2014. In a 40-hour period, 15 teams of developers leveraged point-of-sale and product master data to create applications related to cooking, health and the shopping experience.

Startup or seed accelerators—programmes with mentorship, educational components and funding—may also be used to foster rapid development of Network concepts.
**Actionable Products**

While approaches may vary, the end goal remains the same. From an Incubator, the major outcome is an *Insights Report* that presents actionable products, including forward-looking analysis, results, prototype standards and services, and recommendations to GS1.

Types of recommendations to GS1 include:

- GS1 is recommended to start work on the development of new standards, systems and/or solutions based on the exploratory work of an Incubator
- Further exploration is needed within the Innovation Network, with recommended investment levels and next steps, such as a pilot or prototype
- New GS1 work is not recommended at this time, with rationale and lessons learned
Two Incubators have been launched with exploration activities currently underway: The Future of Identification and Digital Coupons.

The Future of Identification Incubator

Unique identification is at the core of the GS1 value proposition. The objective of The Future of Identification Incubator is to provide a roadmap for industry to achieve the globally unique identification of everything, looking ahead to the time frame of 2020 - 2025.

To explore this concept, the first GS1 Future of Identification workshop was hosted by GS1 Spain in Barcelona in May.

The goal of the workshop was to begin building the global vision for unique identification and to begin the innovation process for GS1 standards’ identification and capture capabilities.

Thirty-six (36) participants from major retailers, solution providers, multi-national manufacturers, standards organisations, universities and GS1 attended the Barcelona workshop.

The team focused on two perspectives of the purchasing experience:

• Consumer perspective: As a consumer, what do we demand, expect and need from a shopping experience?
• Retailer perspective: As a retailer, what is needed to be successful and how can we meet our customers’ needs?

Participants were guided through several exercises, such as mindmapping, that were designed to tap creative thinking and experiences and lead them to a set of prioritised work items.

Many opportunities were identified, including the following:

**Personalisation:** Create an Avatar ID for management of a consumer’s multiple trust relationships and profiles to ensure privacy of personal data used in various services. For example, a consumer could create one Avatar ID with personal data that he is willing to share with the public and one Avatar ID that he is only willing to share with healthcare professionals. Create a Customisation ID to identify products designed directly by the consumer. For instance, a consumer could create a Customisation ID that identifies the special combination of ingredients that she prefers for her coffee.

**Consumer needs:** Develop more comprehensive, safer ways to collect consumer requirements.

**Build relationships:** Consider the World Wide Web Consortium (W3C) for co-development of the Avatar ID solution based on its existing efforts and the Global Navigation Satellite Systems Agency to leverage satellite-based data for logistics and digital offers and define Serialised Global Location Number mapping to GPS coordinates. Additional work must be done to engage women, diverse socio-economic groups and underrepresented regions.
Next steps for The Future of Identification Incubator include:

- Outputs from the workshop have been posted in the InZone to stimulate Network-wide discussion, and follow-up discussions will be scheduled with workshop participants.
- In September 2015, a second workshop will be held at the Massachusetts Institute of Technology (MIT) in Boston.
- A draft *Insights Report: Identification Roadmap, 2020-2025* will be made available in December 2015.
- The *Identification Roadmap, 2020-2025* will be published in June 2016.

For more information about The Future of Identification Incubator, contact Coen Janssen, Senior Manager of AIDC, GS1, at coen.janssen@gs1.org, Andrew Hearn, Lead of Global AIDC Team, GS1, at andrew.hearn@gs1.org or email innovation@gs1.org.

During The Future of Identification Incubator workshop, participants brainstormed from perspectives of the consumer and retailer about the consumer purchasing experience.
Digital Coupons Incubator

Digital coupons are garnering a great deal of interest from consumer packaged goods companies and retailers, both traditional and online. With always-on, always-connected consumers, digital engagement is critical to drive shopper loyalty while providing a seamless consumer experience.

However, the digital coupon ecosystem is highly fragmented with a myriad of proprietary solutions in use and limited interoperability between retailers, coupon clearing houses, point-of-sale suppliers, brands, application developers, distributors and mobile operators. This fragmentation makes it difficult, if not impossible, for retailers and brands to effectively distribute and accept digital coupons on a large scale and prevents the growing number of consumers using mobile devices to enjoy a hassle-free purchasing experience.

The Digital Coupons Incubator is exploring options for a global interoperable digital couponing framework. It is analysing all related technical solutions and processes for the mass distribution and acceptance of digital coupons, involving multiple brands, retailers, distribution and clearing channels.

The Digital Coupons Incubator has established a pilot in the U.K., intended to prove commercial and technical viability, and to demonstrate applicability and effectiveness of existing and potential future GS1 standards. The pilot will create baseline global Application Program Interfaces (APIs) for interoperability, test existing GS1 standards, identify gaps and standardisation opportunities and share the results.

GS1 UK secured commitments from key partners in the U.K. market and funding for a commercial implementation pilot that is now underway. Results are expected in July 2015. The U.K. pilot adds to the knowledge base from widespread activity throughout GS1 in Europe and the U.S.—as well as the Groupe Speciale Mobile Association (GSMA), representing 800 mobile operators across 219 countries. Together, GS1 and GSMA are focused on incubating, innovating and creating new opportunities for its membership with the end goal of driving a globally harmonised digital couponing framework, which, in turn, can influence digital commerce.

In addition to the U.K. pilot, the Incubator is also analysing adjacent concepts and interconnected programmes such as promotions, vouchers, e-gifts and refunds. Using the InZone, topics and opportunities are being discussed, including:

- Interoperability of paper and digital/mobile coupons, including systems, processes and barcodes
- Extending GS1 identification keys and coupon settlement processes to include new Web payment specifications from W3C
- Establishing GS1 couponing standards through GSMA in value-added service (VAS) networks operated by the world’s largest community of mobile network operators
- Providing semantic markup for Digital Coupons, for Search Engine Optimisation (SEO) and Search Engine Marketing (SEM)
- Creating couponing-related efficiencies for location marking/beacons, digital wallet inclusion, load-to-card, print-at-home, digital receipts, mobile ad distribution networks, social commerce, social marketing and other related digital processes
The Insights Report from the Digital Coupons Incubator is planned for publication in October 2015.

For more information about the Digital Coupons incubator, contact Dipan Anarkat, Director, Emerging Technologies, GS1, at dipan.anarkat@gs1.org or email innovation@gs1.org.
Auto-ID Labs Engagement

The Auto-ID Labs are made up of six independent academic institutions that research and develop new technologies for revolutionising global commerce and providing previously unattainable consumer benefits. For more than ten years, the network of Labs has worked closely with GS1 and EPCglobal in the development of open standards for supply chain visibility and provided strategic guidance to several flagship projects.

Given their primary role of “future proofing” for GS1, the work of the Auto-ID Labs is being integrated into the Innovation Network.

All projects will have accountability to the Innovation Board, as well as increased exposure to the GS1 user community. This increased visibility benefits the Labs, by allowing GS1 industry and retail communities to take an interest in their projects.

The Network’s InZone is positioned as the primary forum in which to discuss and showcase Lab work efforts, as well as to provide a central source for regular project updates, interim deliverables and published studies by each Lab.

Future Auto-ID Lab projects are likely to touch on areas such as the source-to-consumer value chain, the end-to-end Internet of Things, wireless technologies and distributed visibility landscapes.

As in other areas of activity within the Network, the Labs will be encouraged to organise and host hackathons, pilots and workshops around topics and sectors.

For more information about the Auto-ID Labs, contact Craig Alan Repec, Senior Manager, EPCglobal Technology at craig.alan.repec@gs1.org

University Programme

The Innovation Network is considering the creation of a larger network of universities—beyond the Auto-ID Labs and non-conflicting with the existing Labs—to engage talent and expand the innovation landscape in a way that is beneficial to all. Many universities already partner with GS1 MOs in their country to conduct research and provide two-way education.

The aim is to use the Innovation Network’s collaboration platform to more easily connect the GS1 MOs and universities around the world in order to share ideas, cooperate on relevant projects and develop projects that have a regional or global scope.

The expected benefits include the following:

• Enrich the Innovation Network with fresh ideas from students and faculty
• Implement a global and consistent approach to GS1 interactions with universities
• Facilitate collaboration and thus avoid duplication

Next steps for the University Programme include analysing the current situation, and then the creation of a detailed framework for success.

For more information about the University Programme, contact Henri Barthel, Vice President, GS1 System Integrity and Global Partnerships at henri.barthel@gs1.org.
6 Future

A year from now, the Innovation Network is expected to have identified a number of ideas that have been or are being extensively explored. GS1 and other participants will have made strategic decisions about whether or not to invest in ideas and move forward—for reasons well-understood thanks to the work of the Innovation Network.

Short-term key performance indicators (KPIs) for the Network may be as straightforward as levels of participation and the number of new ideas that are generated.

The most important KPI—in fact, the ultimate KPI—will be to look back after a few years at a number of important new GS1 standards, services and solutions that were first identified by the Innovation Network and that are having a positive impact on people, businesses and the world.

To learn more about the GS1 Innovation Network, contact April Cason, Project Manager, at april.cason@gs1.org or email innovation@gs1.org.

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About GS1
GS1 is a neutral, not-for-profit, global organisation that develops and maintains the most widely used supply chain standards system in the world. GS1 standards improve the efficiency, safety, and visibility of supply chains across multiple sectors. With local Member Organisations in over 110 countries, GS1 engages with communities of trading partners, industry organisations, governments, and technology providers to understand and respond to their business needs through the adoption and implementation of global standards. GS1 is driven by over a million user companies, which execute more than six billion transactions daily in 150 countries using GS1 standards. More information at www.gs1.org.