Search for a Spanish Partner for a Bilateral R&D Project

Organization MSA university www.msa.edu.eg	
Date of Request:	11.11.2026
Company name:	MSA university
Contact person and title/ designation:	Dr.Adel Ghannam Management Information Systems
E-mail:	mghanam@msa.edu.eg
Phone number:	01223109156
Mobile number:	01223109156
Website:	www.msa.edu.eg

SECTION 1: Entity launching the partner search *(Please give brief / to the point explanations. For more explanation on any point below, you may add a short paragraph as an annexure, with this document.)*	
Sector	Information Technology
Entity mission or core functions	University Education and Research
Date of establishment	1996
Ownership (if public and traded, add stock exchange and ticker symbol)	Private
Total number of employees	500 Number of students +12000
Number of employees in R&D	50
Key products sold or services provided	Applied R&D
Entity core technical competences	The search is focused on IT for manufacturing
Key R&D programs and activities	The last 10 years relevant IT system for Global manufacturing interoperability…Pls see attached Dr.Ghannam background
Examples of accomplishments	Please see Dr.Ghannam background
Company strategic orientation	Business application of IT

SECTION 2: Spanish Company Profile *(Please provide a brief summary of the prospective partner company or organization. This summary may address some or all of the points below)*	
Profile of ideal technology partner	Manufacturing
Core technological competencies and expertise	Application of IT in manufacturing management
Other essential qualifications (e.g.: ownership, track records etc.)	
If you have a list of companies with whom you are in contact or interested in contacting, please provide contact details	
If you are interested in collaboration: please specify details and other important information you want to share with a potential company	
Interested areas of collaboration	Supply chain management
Specific R&D contribution you are seeking/offering	Availability of Typical technical specifications of raw material and components. It will be used in developing "AI-Driven Virtual Warehouse of Raw Material for Manufacturing Interoperability"

Dr.Adel Ghannam background

Dr.Ghannam started his career with the Egyptian National Research Center (NRC) where he filled the positions of Electrical Engineer and then Assistant researcher from 1966 till 1972. He was awarded the M.SC through a joint collaboration between Cairo University and Manchester University (UK)(1967-1970).From 1972 to 1975, he was awarded a fellowship at Dynamic System Laboratories in Italian National research Center – Italy, where he was working in the design of Hybrid computer interfaces and awarded the PH.D in 1975. In 1975, he returned to NRC in Cairo to establish the Computer System Group till 1978. He

joined ICL –UK (Midle East region) from 1978 till 1989. During this period, he occupied the posts of Technical Development Manager from1978 till 1981, Manager of Middle East Center of computer studies from 1981 till 1986 and lastly ME Marketing Manager from 1986 till 1989. He established a private software and consultancy company (ISG) in January 1989 ,where he was the General Manager ..He then established in 2002 the consultancy company ISGE ,the Industrial Systems and Global Enterprise, that focuses on Strategic business planning, IT architecture planning and design using TOGAF ,Training on IT for Managers,Software Engineering with emphasis on product quality and metrics , project management , Implementation and training of ERP systems and shop floor control in the manufacturing sector.He joined MSA university since 2013 , management information systems

The practical record summary of Dr.Ghannam is demonstrated by the following statistics:
1- 60 Projects on designing and implementing ERP and supply-chain-management
2- A National R&D project in Information Technology and its application to Business-Process-Management , and Work force Re-alignment. The project was funded by the EU through its office in Cairo-Egypt, and the Egyptian Industrial Modernization Center (IMC) . The main target was to develop unified practical –quantitative approach to assess Business-gap areas in 47 manufacturing firms , that can be addressed effectively by the IT and Internet e.business technology , and develop an IT architecture , aligned to the developed Model , based on the state of Art technology
3- A national R&D project to deploy new wireless technology to develop an e. Manufacturing system, in cooperation with The Ahram-Canadian University,cairo, and the Electronic Research Institute,Cairo
4- A National project funded by the EU to run the R&D work required to establish the " Textile R&D Technology Center in Egypt"
5- A National project funded by the EU to run the R&D work required to establish the Egyptian National Business Information Network
6- A National project funded by the UNDP to run the R&D work required to establish a National Software Test Center
7- A National project funded by the USAID to run a development program for the SME in the field of Software Engineering.
8- 2000 Training days on Business-Process-Management and software Engineering
9- 15 Projects on Information-Technology- development and Management in Governmental sector
10- 3000 Days of Outsourcing Services in Information Technology Management
11- Teaching, R&D for 40 years

The concept note of the target R&D

The virtual marketplace is an intelligent warehouse displaying the seller's wares, enabling secure collection of orders and payments, forwarding orders to the seller, tracking delivery to the purchaser, and releasing payment to the seller after deducting a fee. All the transactions mentioned are performed without the risk of human interaction, which usually results in delays, errors, and operational risks.

Each subscribed manufacturer in the virtual market will depot their excess material data into this virtual warehouse. This material warehouse will be available to all subscribed manufacturers, securing continuous raw material availability. Introducing intelligent services

allows collaborative interoperability between subscribed manufacturing entities to search for raw materials.

Crucially, this intelligence search now leverages Generative and Agentic AI to enable on-demand ontology generation and enquiry. Instead of forcing factories to rigidly harmonize their data upfront, the organization simply states its need, shortage, or excess using its own internal terminology, legacy codes, or native language. The AI system acts as a dynamic broker, automatically interpreting, mapping, and aligning this request across different languages and industries to find the exact match. This eliminates the historical difficulty of unifying raw-material codes in different factories.

The target system is a foundation to extend the concept of the Extended-Enterprise to a full Global-Value-Chain management system.

The Problem: Semantic Ambiguity in Manufacturing

The understanding of the meaning of a 'component', raw material, or manufacturing resource is traditionally down to human interpretation of text. There might be alternative definitions that are incompatible, or they might be explaining the same concept but in different ways. It is not easy, if at all possible, to categorically identify the level of compatibility that exists across these definitions.

Material descriptions typically provide text-based informal definitions. Such text-based descriptions can lead to multiple and possibly inappropriate interpretations when multiple manufacturing firms are using the same material/component to implement a production order.

Such problems are resolved when humans interact with the application, as in the case of traditional e-commerce sites (such as Amazon). However, this is difficult for modern collaborative manufacturing industries that use multiple interoperable ICT systems. Semantic differences across different ICT systems can be reconciled through the use of computationally, machine-understandable knowledge exchange using semantics.

The Solution: Adaptive Semantic Interoperability

Firms' interoperability should be based on semantic data exchange rather than syntactic exchange. Semantic data, which focuses on the meaning and relationships within data, is referred to as ontology.

Semantic interoperability relies mainly on consistent data ontology. Raw material ontology is a machine-readable data model that defines the types, properties, and relationships of unprocessed basic manufacturing inputs. It acts as a semantic layer allowing computer systems and databases to understand what raw materials are, how they behave, and how they relate to one another. It is fundamental to modern knowledge of engineering systems. Knowledge engineering uses these semantic models to represent, organize, and reason about knowledge, enabling intelligent systems to understand and interact with information in a human-like way, which is the target of modern Artificial Intelligence (AI) systems.

Having one centralized ontology for all subscribers restricts bilateral interoperability and creates high adoption barriers. An adaptive approach is more resilient. This means having the capability to automatically generate a specific ontology at the sender side using Generative AI, and publishing this specific ontology to an Ontology Hub. A subscriber can then search this ontology hub for their required raw material ontology.

To guarantee zero-error matching, the system employs a Multimodal Material Competence Matrix powered by a Hybrid AI approach:

1. Semantic AI: Understands deep engineering relationships and functional behaviors.
2. Visual AI (Computer Vision): Allows users to upload a photo of a spare part or raw material. The AI extracts physical dimensions and markers, completely bypassing text-based naming discrepancies, language barriers, and translation errors.

Technical Foundation

The concept is based on the semantic web architecture, developed by the semantic web originator, known as the "Layer Cake" [Tim Berners-Lee, SEMANTIC WEB DEVELOPMENT, Massachusetts Institute of Technology (MIT) / World Wide Web Consortium (W3C), AFRL-IF-RS-TR-2006-294, Final Technical Report, September 2006].

The semantic web technology is well supported by a set of W3C standards: RDF, OWL, and SPARQL.

(References: https://www.w3.org/RDF/ | https://www.w3.org/OWL/ | https://www.w3.org/TR/sparql12-update/)

The Target of This Project

An Ontology Business Information System managing a virtual components warehouse. This approach combines wireless tracking technology (like RFID) with ontologies. While a standard RFID wireless tag tells where an item is, an ontological framework tells what the item is, how it relates to other components, and how it should be handled.

Aligned Economic and Marketing Models

To ensure the project's viability, scalability, and attractiveness, the technical architecture is bridged with robust Economic and Marketing models. These models demonstrate clear Return on Investment (ROI), profitability, and strategic market capture, directly linking user financial gain to platform sustainability.

1. The Economic Model: Driving Profitability, User Gain, and Macro-Economic Impact

The economic model governs supply-side costs, pricing, and revenue streams, transforming the virtual warehouse from a theoretical concept into a highly profitable, self-sustaining SaaS (Software-as-a-Service) ecosystem. It employs advanced economic techniques to maximize Return on Investment (ROI) and value for both the platform and its subscribed manufacturers:

Direct Financial Gain Action Plan for Users:

- The "Cost of No Inventories" (Zero-Inventory Optimization): Manufacturers traditionally tie up massive working capital in safety stock to prevent production downtime. By providing real-time, guaranteed access to a shared virtual warehouse, participating factories can drastically reduce their safety stock levels, freeing up cash flow and reducing warehouse-holding costs by an estimated 20–35%.
- Monetization of Dormant Assets: Excess raw materials and spare parts sitting idle in factory warehouses represent sunk costs. The platform transforms these dormant assets into immediate revenue streams through peer-to-peer B2B transactions, directly improving the participating manufacturer's bottom line.
- Elimination of Emergency Procurement Premiums: Production halts due to missing components often force factories to pay premium prices for expedited shipping. The platform's rapid, localized AI matching eliminates these emergency costs, yielding direct, measurable savings.
- Cloud-Based Standardization (Shared Infrastructure ROI): Instead of each factory investing millions in proprietary ERP harmonization or custom integration, the platform offers a shared, cloud-based ontological layer. This drastically lowers the Total Cost of Ownership (TCO) for individual manufacturers, making advanced interoperability accessible to mid-sized enterprises, not just multinational corporations.

Advanced Pricing & Sustainable Revenue Streams:

- Dynamic Micro-Transaction Fees: A scalable 1–3% fee on successful B2B material exchanges, ensuring the platform grows in revenue as transaction volume increases.
- Shared Logistics Cost Optimization: The Agentic AI groups geographically proximate matches, allowing factories to share transportation costs, directly improving the buyer's margin and the seller's net profit.
- Circular Economy Incentives: Partnering with governmental bodies to help factories quantify and report waste reduction, potentially unlocking green tax credits or sustainability grants for platform users.
- Tiered SaaS & Premium API Services: Generating recurring revenue through tiered SaaS subscriptions (Basic, Pro, Enterprise) for advanced analytics and Visual AI matching, alongside premium API integration services for large-scale enterprise ERPs.

2. The Marketing Model: Influencing Decisions, Ensuring Satisfaction, and Driving Rapid Market Capture

The marketing model translates complex AI capabilities into compelling, tangible business value propositions. It drives demand, customer acquisition, and strategic positioning by systematically guiding the B2B buyer's journey from initial awareness and purchase intention to long-term ecosystem loyalty.

- Unique Selling Proposition (USP) & Risk-Reversal Guarantees:

The primary marketing message is: "Speak your system's language; our Hybrid AI understands the rest." By removing the burden of data harmonization, we eliminate the biggest barrier to entry. Furthermore, marketing will prominently feature a "Zero-Error Match Guarantee" backed by the ontological Multimodal Competence Matrix. Manufacturers were previously hesitant to join shared platforms due to the risk of receiving incompatible materials. The Visual + Semantic matrix guarantees that a part is matched by its physical and functional reality. Additionally, the strategy highlights Cloud-Standardized Quality

Assurance, emphasizing that every matched component comes with a cloud-verified, ontological quality profile. Buyers are not just buying a "part"; they are buying a guaranteed functional match, mitigating the catastrophic financial risk of production downtime and shifting buyer attitude from skepticism to absolute confidence.

- Shaping Purchase Intention: Speed to Market & Embedded TCO Calculator:

o Speed to Market (Fast Delivery Assurance): Marketing will heavily emphasize the drastic reduction of lead times. By matching excess local inventory with immediate local demand, the platform reduces procurement lead times from weeks (or months, in the case of imported custom parts) to hours or days.

o Embedded Total Cost of Ownership (TCO) Calculator: Integrated directly into the platform's search interface, this dynamic tool shifts the buyer's focus from the mere "sticker price" of a component to its overall financial value. The Agentic AI automatically compares five key cost pillars between the buyer's traditional method and the platform's localized match:

1. Acquisition Price: (Global market rate vs. peer-to-peer excess inventory rate)
2. Administrative Costs: (RFQs, negotiations, and manual processing vs. automated AI matching)
3. Logistics & Customs: (International freight/duties vs. localized domestic shipping)
4. Inventory Holding Costs: (Capital tied up in safety stock vs. Just-In-Time availability)
5. Risk & Downtime Costs: (Lead-time delays vs. guaranteed rapid delivery).

o The Output & Industry Benchmarking: By subtracting the Platform TCO from the Traditional TCO, the interface presents a clear, quantifiable ROI to the buyer in real-time. Grounded in industry benchmarks for B2B manufacturing interoperability and shared virtual warehousing, the calculator is projected to demonstrate total procurement cost reductions ranging from 20% to 40%, alongside lead-time reductions of up to 70%. This provides undeniable, data-driven proof of value and directly drives purchase intention before the user even clicks "purchase."

- Driving Customer Satisfaction: Frictionless UX & Transparency:

o Frictionless UX (User Experience): The platform removes all operational barriers to entry. Manufacturers are not forced to manually re-code, translate, or harmonize their internal data. They simply state their needs in their native language, use their existing legacy codes, or upload a photo.AI large language model will generate the ontology model. This ensures seamless, zero-effort onboarding.

o Transparency: The AI never acts as a "black box." Instead, it provides clear, verifiable proof of why a specific match was recommended (e.g., explicitly stating: "Matched because: 1) Visual AI confirmed 98% geometric similarity to your photo, 2) Syntactic AI successfully mapped your local code to the supplier's code, and 3) Semantic Ontology validated identical material grades"). This "blockchain-style" ontological traceability gives procurement managers absolute peace of mind regarding the exact quality, specifications, and origin of the component, directly building long-term trust.

- Cultivating Long-Term Loyalty:

o Predictive Value-Add: The Agentic AI will proactively alert manufacturers when their historically purchased parts are available as excess stock in the network at a discount, shifting the platform from a "reactive tool" to a "proactive profit center."

o Tiered Loyalty Programs: Implementing "Trusted Partner" badges and reduced transaction fees for high-volume, high-rating users, creating high switching costs and fostering deep ecosystem lock-in.

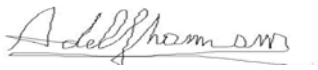
- Execution Tactics:

o Account-Based Marketing (ABM): Directly targeting procurement directors and plant managers in the targeted consortia with personalized ROI case studies.
o Thought Leadership: Publishing joint whitepapers on "The True Cost of Supply Chain Fragmentation" to position the platform as an industry authority, driving inbound interest.
o Network Effect Amplification: Leveraging industry associations (e.g., Federation of Egyptian Industries) to showcase pilot successes, creating a bandwagon effect where non-participating factories fear being left at a competitive disadvantage.

Conclusion and Strategic Value for the ESIP call

This proposal represents a paradigm shift in manufacturing interoperability. By moving away from rigid, centralized standardization and embracing Generative and Agentic AI for on-demand ontology generation, coupled with a Multimodal Competence Matrix, we solve the industry's most persistent pain points: language barriers, legacy code mismatches, and trust deficits.

The seamless integration of Economic Model and Marketing Model ensures that this R&D project is not only technologically groundbreaking but also commercially viable, scalable, and highly attractive for long-term investment. This bilateral Egyptian Spanish collaboration will position Egypt at the forefront of AI-driven Global-Value-Chain management, delivering measurable academic, industrial, and macroeconomic returns.



Signature
Name: Dr.Adel Ghannam
Date: 11.11.2026