INDUSTRY 4.0: Glossary of terms/buzzwords/jargon

Term	Meaning/description
Additive or 3D manufacturing	A process by which digital 3D design data is used to build up a component in layers by depositing material. The term "3D printing" is increasingly used as a synonym for Additive Manufacturing. However, the latter is more accurate in that it describes a professional production technique which is clearly distinguished from conventional methods of material removal. Instead of milling a workpiece from solid block, for example, Additive Manufacturing builds up components layer by layer using materials which are available in fine powder form. A range of different metals, plastics and composite materials may be used.
Advanced manufacturing	Highly specialised products and processes in areas such as medical technology, biopharmaceuticals, mining, agribusiness, aerospace and defence, where expertise is the source of competitive advantage. It denotes the process by which knowledge-intensive value is added in both the pre- and post-production phase in areas including research and development, concept design, planning, engineering and after-sales service.
Artificial Intelligence (AI)	An area of computer science that emphasizes the creation of intelligent machines that work and react like humans. AI is the broader concept of machines being able to carry out tasks in a way that we would consider “smart”.
Augmented Reality (AR)	A technology that superimposes a computer-generated image on a user's view of the real world, thus providing a composite view.
Automation	The use of various control systems for operating equipment such as machinery, processes in factories, boilers and heat treating ovens, switching on telephone networks, steering and stabilization of ships, aircraft and other applications and vehicles with minimal or reduced human intervention.
Big Data	Data sets that are so voluminous and complex that traditional data processing application software are inadequate to deal with them. Lately, the term tends to refer to the use of predictive analytics, user behaviour analytics, or certain other advanced data analytics methods that extract value from data, and seldom to a particular size of data set.
Building Information Modelling (BIM)	A digital representation of physical and functional characteristics of places. A BIM is a shared knowledge resource for information about a place forming a reliable basis for decisions during its life-cycle; defined as existing from earliest conception to demolition.
Blockchain	The blockchain is an incorruptible digital ledger of economic transactions that can be programmed to record not just financial transactions but virtually everything of value. It is like a spreadsheet that is duplicated thousands of times across a network of computers. This network is designed to regularly update this spreadsheet, which is the basis of the blockchain. Information held on a blockchain exists as a shared — and continually reconciled — database. This is a way of using the network that has obvious benefits. The blockchain database is not stored in any single

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	location, meaning the records it keeps are truly public and easily verifiable. No centralized version of this information exists for a hacker to corrupt. Hosted by millions of computers simultaneously, its data is accessible to anyone on the internet. Bitcoin is just a subset of Blockchain — that is, Blockchain is the platform that enables Bitcoin and other cryptocurrencies to be exchanged.
Circular economy	An alternative to a traditional linear economy (make, use, dispose) in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life.
Connected enterprise	See Industrial Internet of Things
Data literacy	The ability to derive meaningful information from data, just as literacy in general is the ability to derive information from the written word. The complexity of data analysis, especially in the context of big data, means that data literacy requires some knowledge of mathematics and statistics.
Design thinking	An iterative process in which we seek to understand the user, challenge assumptions, and redefine problems in an attempt to identify alternative strategies and solutions that might not be instantly apparent with our initial level of understanding. At the same time, it provides a solution-based approach to solving problems. It is a way of thinking and working as well as a collection of hands-on methods.
Digital literacy	Having the skills you need to live, learn, and work in a society where communication and access to information is increasingly through digital technologies like internet platforms, social media, and mobile devices. It involves knowing how to use a range of technologies to find information, solve problems or complete tasks. Digital literacy is also about knowing how to act safely and respectfully online.
Digital disruption	An effect that changes the fundamental expectations and behaviours in a culture, market, industry or process that is caused by, or expressed through, digital capabilities, channels or assets.
Digitalisation	The use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business. Note: This is different to “digitisation” which is the process of converting information from a physical format into a digital one.
Fragmentation	With the exponential rise of billions of different things be used in various industry verticals and ecosystems for various applications, along with competing standards, fragmentation of IoT will arise.
Internet of Things (IoT)	IoT is a network of intelligent computers, devices, and objects that collect and share huge amounts of data. The collected data is sent to a central Cloud-based service where it is aggregated with other data and then shared with end users in a helpful way. IoT is also referred as the convergence of IT and Operational Technology (OT).

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Industrial Internet of Things (IIoT)	Sometimes IIoT is used interchangeably with Industry 4.0 or the Fourth Industrial Revolution. Definitions may vary. A more precise definition for IIoT is that it is mainly used in the scope of IoT applications outside of the consumer space and is about applications and use cases across several sectors, to distinguish between consumer IoT applications and business/industry applications. IIoT applications can arise in manufacturing, logistics, oil and gas, transportation, energy/utilities, mining and metals, aviation and other industrial sectors and in use cases which are typical to these industries. IIoT is defined as “machines, computers and people enabling intelligent industrial operations using advanced data analytics for transformational business outcomes”. Another definition for IIoT is to describe the industrial transformation in the connected context of machines, cyber-physical systems, advanced analytics, AI, people, cloud, edge computing and so forth.
Industry 4.0	Represents the fourth industrial revolution (originally) in manufacturing and (now) industry. Industry 4.0 is the current industrial transformation with automation, data exchanges, cloud, cyber-physical systems, robots, Big Data, AI, IoT and (semi-) autonomous industrial techniques to realise smart industry and manufacturing goals in the intersection of people, new technologies and innovation.
Lean manufacturing	Or lean production, often simply "lean", is a systematic method for waste minimisation within a manufacturing system without sacrificing productivity. Lean also takes into account waste created through overburden and waste created through unevenness in work loads.
Machine learning	Sometimes used interchangeable with AI. However, Machine Learning is a current application of AI based around the idea that we should really just be able to give machines access to data and let them learn for themselves.
Micro-credentials	Like mini-degrees or certifications in a specific topic area. They can either be broad, such as 'Machine Learning,' or specific.
Operational Technology	Where IT is information technology (IT) systems is used for data-centric computing, operational technology (OT) systems is used to monitor events, processes and devices and make adjustments in enterprise and industrial operations.
Platform economy	A platform or complement strategy differs from a product strategy in that it requires an external ecosystem to generate complementary product or service innovations and build positive feedback between the complements and the platform. The effect is much greater potential for innovation and growth than a single product-oriented firm can generate alone. Extremely simplified, a platform business serves as a connector between interdependent people and the product or service they are seeking. It’s like saying,

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	“to be in that business you have to know someone.” A platform is the someone.
Pull economy	In the "Push Economy," we got used to being proactive, to pushing our presence and credentials. Want new customers? Push your brand out there via newspaper ads and 30-second spots. Hunting for a new job? Apply by pushing your résumé. The whole paradigm centred on aggressive, even forceful, promotion in order to generate and convert leads. In the pull economy, people are looking for you and they convert based on your reputation – what they find online from content that you share (like blogs, a company website, corporate social media) and what others have shared about you (e.g. review spaces).
search engine optimisation (SEO)	The process of affecting the online visibility of a website or a web page in a web search engine's unpaid results
Servitisation	The strategy of creating value by adding services to products or even replacing a product with a service. Selling maintenance contracts for capital goods is an example of a service being added to a product.
Shared economy	Also known as collaborative consumption, is a trending business concept that highlights the ability (and perhaps the preference) for individuals to rent or borrow goods rather than buy and own them.
Smart cities	An urban development vision to integrate multiple information and communication technology (ICT) and IoT solutions in a secure fashion to manage a city's assets including local departments' information systems, schools, libraries etc.
Smart grids	An electrical grid which includes a variety of operational and energy measures including smart meters, smart appliances, renewable energy resources, and energy efficient resources.
Vehicle to Grid (V2G)	A system in which plug-in electric vehicles, such as electric cars (BEV), plug-in hybrids (PHEV) or hydrogen Fuel Cell Electric Vehicles (FCEV), communicate with the power grid to sell demand response services by either returning electricity to the grid or by throttling their charging rate.