Smart Factory Demonstrator Proposal v3

Digital Manufacturing Team

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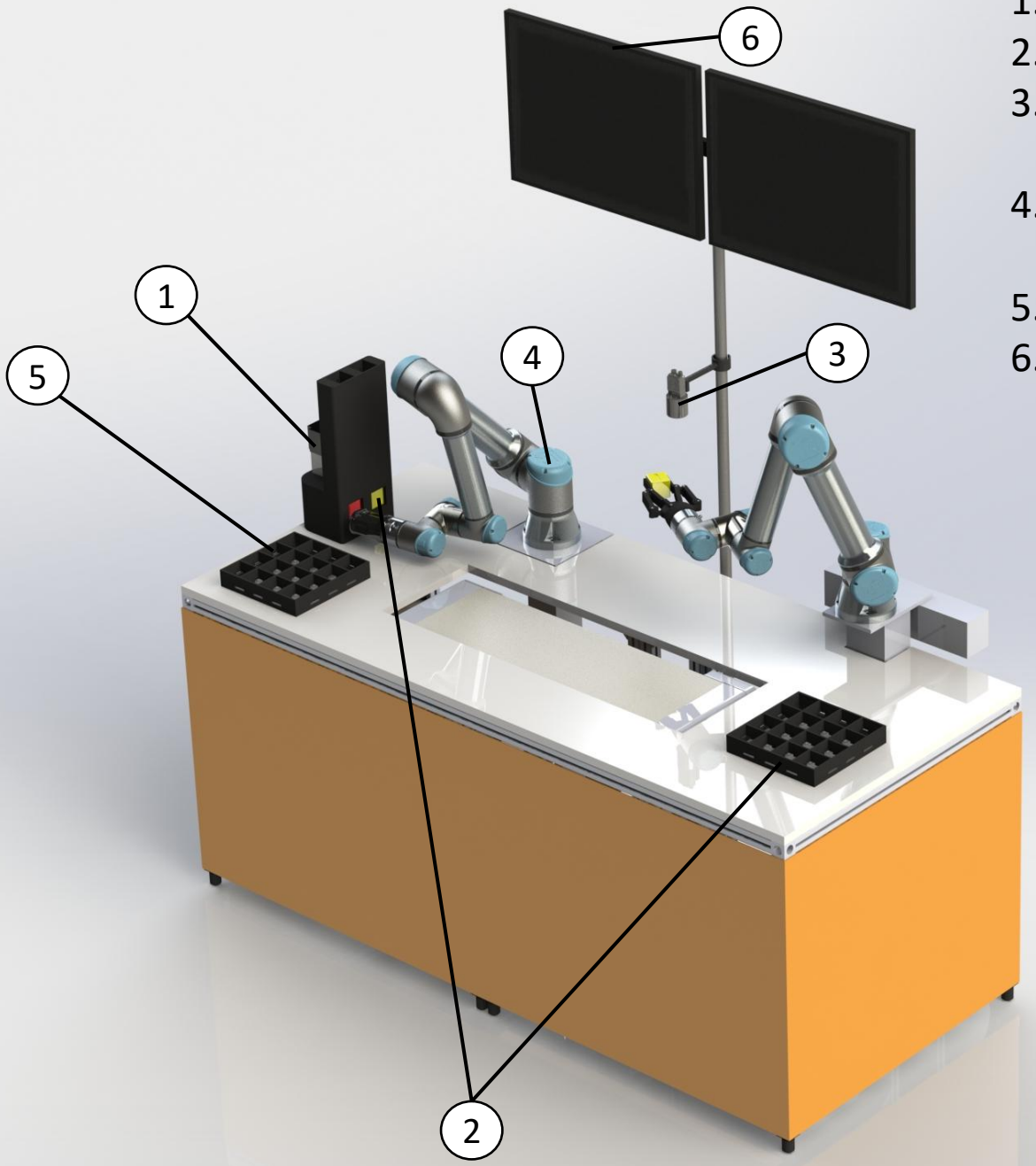
Client Facing Objectives

- Showcase i4.0 ‘Smart Factory’ technology for SME manufacturers in a meaningful way
- Demonstrate manufacturing activity & control concepts, relevant to a range of industries
- Engage SMEs leaders, exploring the relevance and potential benefits to their business
- Help SME leaders to understand the investment case (ROI) and routes/ease of adoption
- Practical use in projects to provide proof of concept support for client processes

WMG Objectives

- Position WMG as i4.0 thought-leader and SME manufacturers champion
- Generate i4.0 leads for Made Smarter and direct WMG engagements
- Develop our understanding of i4.0 through this exercise and its use at Expos
- Use as a tool for internal training and development post completion
- VOTC… Feedback on the demonstrator to improve relevance and engagement

Processes



1. Overall Cell/Process Control
2. Presentation of material
3. Quality control (part recognition, quality defects)
4. Automated assembly process, light out manufacturing
5. Packaging / Palletising
6. QC metrics / shop floor performance dashboards / sensor data

Demonstrator Production Operation – Industry Relevance

Op	Op Description	Industry Sectors	Relevance
1	Overall Cell/Process Control	Food, A&D, Space, Pharma	HSE compliance (UserID/skills, Operator/dress, Process/action) Condition based monitoring (compare measured parameters vs output) Process control / energy management
2	Material Presentation (input)	Consumer Products A&D, Space, Pharma Electronics (PCB)	Automated robot pick & present Material validation, batch control/recording Visual image capture, RFID/QR/barcode reading Characteristics control (size/shape, colour/finish, etc)
3	Quality Control	A&D (Assets, Munitions) Automotive, Transport Food & Drink, Pharma, Chemical Finishing	100% inspection (visual, laser CMM, X-ray/AI, etc) As-built characteristics (Colour, dimensions, weights, etc) Process outcome anomalies & defects detection Foreign body detection
4	Automated Assembly	A&D, Automotive, Rail, Consumer Products Electronics (PCB)	Precision positioning/location & sequencing (e.g. PCB PnP) Fixing integrity, digital drivers (eg torque) Machine tending from previous process As-built BOM record, 3D As-built Model
5	Finished Article (output)	Consumer Products, Electronics (PCB)	Automated robot packing (carton, pallet, etc)

Factory Automation & Robotics

Primary drivers

- **Productivity** improvements as cobots can work through breaks and lights out
- **Capacity** to support growth
- **Quality** improvements to process, reducing the cost of quality
- **Skills** or lack of in the industry leading to specific processes requiring automation
- **Safety** improvements for operators as robots can handle hazardous conditions/materials.

Client objectives

- Health and safety
- Log data for further analytics to understand downtime, energy cost, common quality defects
- Pilot/proof of concept to increase stakeholder buy-in and catalyse automation adoption
- Reduce cost of employment
- Improve reliability and quality of processes
- Support “dim-lights” and “lights-out” manufacture.

WMG activities

- Support business case development, introduction to R&A vendors and integrators and grant/bid writing
- Proof of concept & feasibility studies using cobots and off the shelf AI/ML vision systems
- Bringing in skills to build automation capability within the business long-term
- Complementary offers i.e. digital strategy, factory optimisation
- Introduction to research groups to build partnerships.

We can help the client to understand and de-risk their automation investment

Machine & Process Monitoring (IIoT)

Primary drivers

- **I4.0 Vision:** ambition to be industry 4.0 manufacturer
- **Visibility** of shop floor
- **Efficiency:** cost reduction & improving process
- **Data logging** for further analytics (achieve predictive maintenance, higher efficiency)
- **Asset utilisation:** Customers renting out expensive machines to produce maximum value.

Client objectives

- Real time visibility of shop floor machinery, KPIs, OEE, cycle time.
- Dashboards and reports
- Energy/emission monitoring and reporting including alerts
- Systems and Cloud integration
- Predictive maintenance scheduling
- Real-time safety incident tracking and reporting
- Resource optimization
- Quality control & traceability.

WMG activities

- Assessing and defining operational needs and goals
- Recommend suitable technologies
- Provide framework for real-time data architecture monitoring and analysis
- Assist in selecting and integrating sensors and platforms
- Documenting implementation process and outcomes
- Ongoing support and training for continuous improvement.

We can help the clients unblock bottlenecks by delivering IIoT strategy, solutions and implementation framework

AI and Data Analytics

Primary drivers

Primary drivers for this offering:

- **Unaware,** of the state of AI or the opportunities for them
- **Productivity** improvements by automating routine tasks.

Client objectives

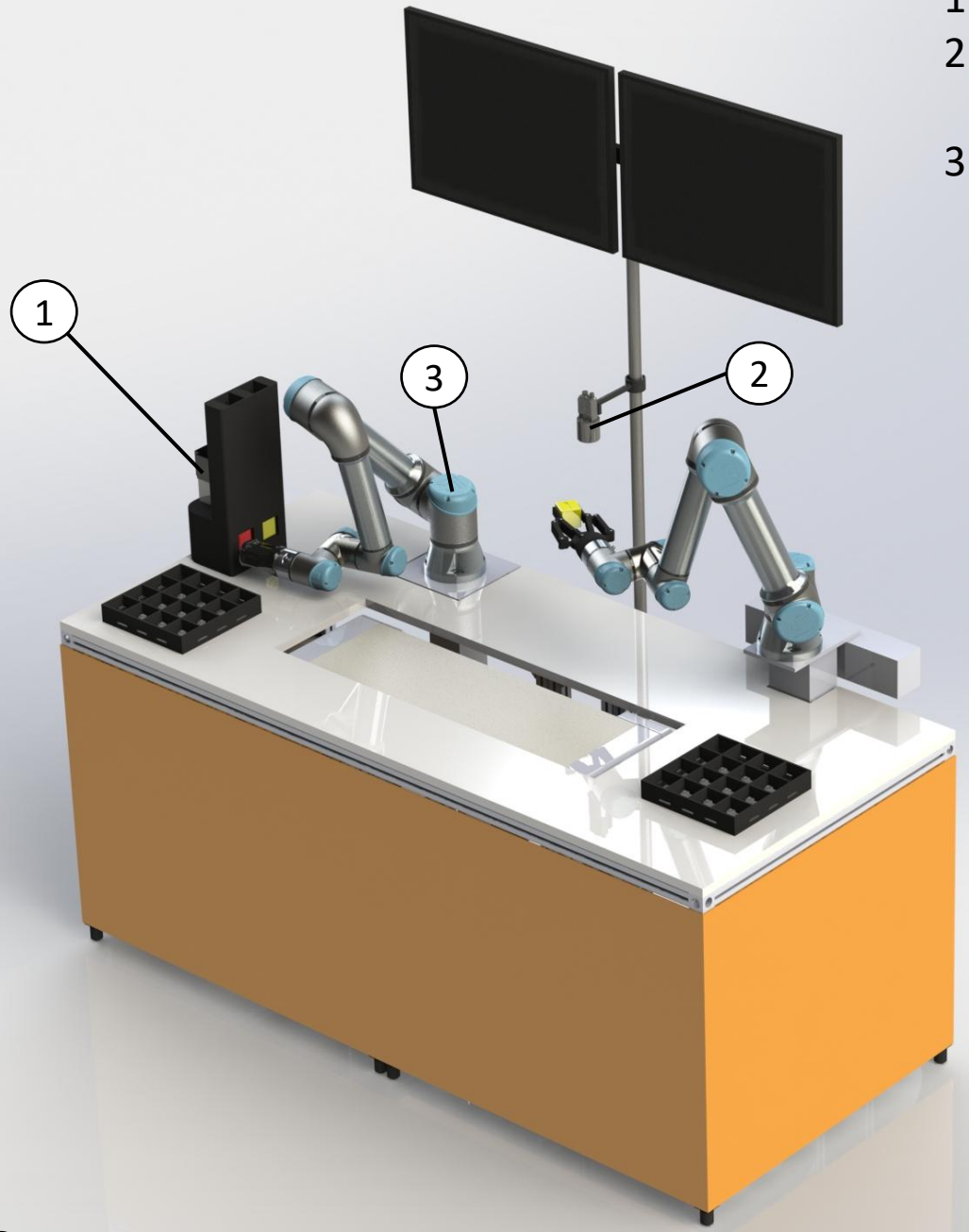
- Gain a baseline understanding of AI and the opportunities for them
- Transition from reactive to predictive decision-making with data
- Optimise resources and cut costs with AI
- Automate data analysis to improve efficiency and free resources.
- Develop a scalable AI strategy for growth
- Streamline processes with AI, reducing manual work and errors
- AI-driven analytics for insights and strategic decisions.

WMG activities

- Identifying business problems
- Creating tailored AI use cases
- Delivering actionable blueprints and AI use case reports
- Assessing systems and designing AI-supportive architecture
- Showcase AI impact by developing POC projects
- Educating on AI implementation and best practices.

We can help customer harness data and AI effectively by providing tailored solutions

1. LOGO! PLC + sensors ~1k
2. Cognex In-Sight 2800 vision system ~10k
3. UR5e cobot ~30k



Technologies + Costs