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Map of ICT technologies in the textile industry

These materials are developed under Erasmus+ Program Key Action 2:
Cooperation for innovation and the exchange of good practices Knowledge Alliance

ICT IN TEXTILE AND CLOTHING HIGHER EDUCATION AND BUSINESS

Project Nr. 612248-EPP-1-2019-1-BG-EPPKA2-KA

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Agenda

- Introduction
- ICT domains in TCI
- Map of ICT in textile industry
- Conclusion

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Digital society

- ICT = Information and Communication Technologies
- We are witnessing digitalization in each area of everyday life

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Different perspectives of ICT

- In everyday life
  - Internet, social media, electronic documents, communication, etc.
- In networking
  - Network transmission protocols, Security provision, Media types, etc.
- In software engineering
  - Software requirements, design, programming, algorithms, etc.

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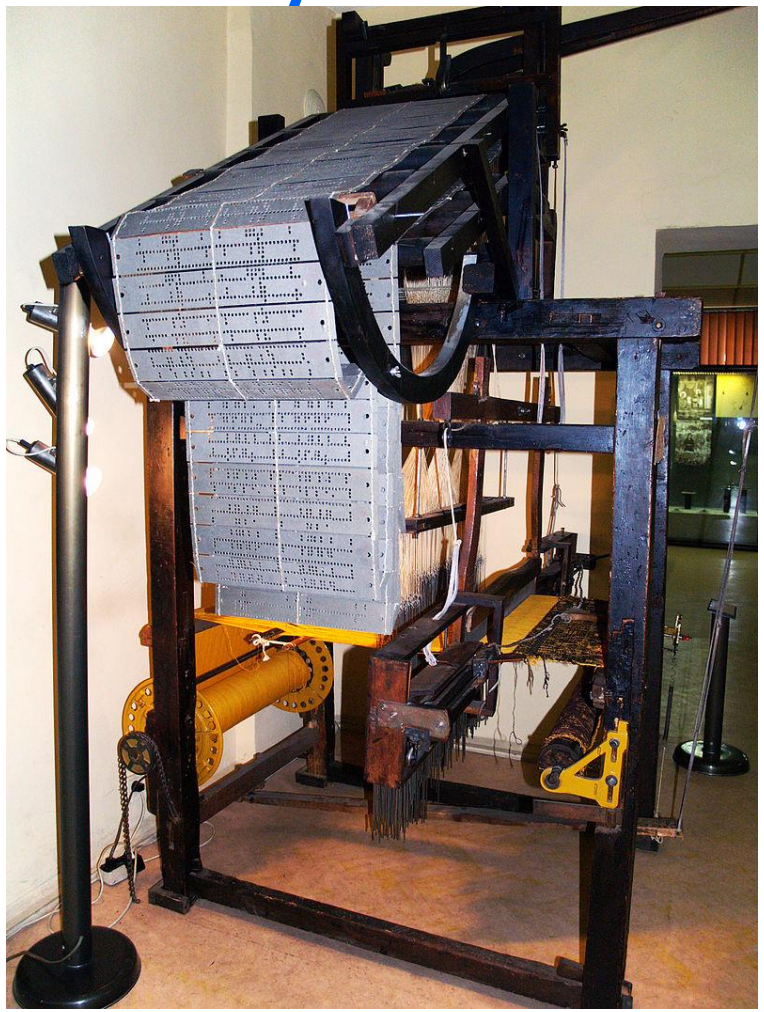
ICT with respect to Textile industry

- Traditionally textile industry uses different software tools to model, develop or communicate initial designs
  - CAD/CAM software
  - Image processing software, e.g. Photoshop
  - Microprocessor controlled machines in textile manufacturing



source: Wikipedia

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Recent advances in ICT

- Mature software engineering methods
- Cloud enabled systems
- Big Data and Machine Learning
- Embedded software “becomes” IoT
- Artificial Intelligence

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Software Engineering

- Definition of Software Engineering

> *"Software engineering is an engineering discipline that is concerned with all aspects of software production from the early stages of system specification through to maintaining the system after it has gone into use."*

(Sommerville, I. Software Engineering. 10th edition, Published by Pearson Education, ISBN: 978-1-292-09613-1, 2016, pp. 21)

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Software engineering activities

- Requirements definition
- Design
- Software implementation
- Software testing
- Deployment and Maintenance

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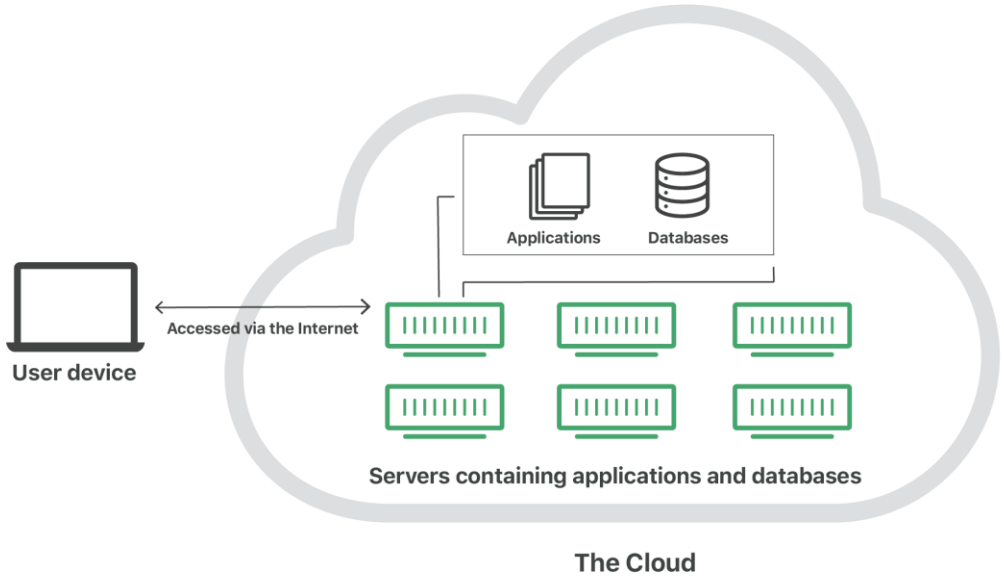
Cloud systems



- Set of interconnected machines over the internet
- Platforms and software that run on these machines
- Acts in front of the user as a single computer

source: https://www.cloudflare.com/learning/cloud/what-is-the-cloud/

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Artificial Intelligence

- Computers would need to possess the following capabilities:
  - **natural language processing** to enable it to communicate successfully in English (or some other human language);
  - **knowledge representation** to store information provided before or during the interrogation;
  - **automated reasoning** to use the stored information to answer questions and to draw new conclusions;
  - **machine learning** to adapt to new circumstances and to detect and extrapolate patterns.

Big Data

Capability to process massive amount of structured and unstructured data which can change constantly

Reasoning

Ability to reason (deductive or inductive) and to draw inferences based to the situation. Context driven awareness of the system

Learning

Ability to learn, based on historical patterns, expert input and feedback loop

Problem solving

Capability to analyze and solve complex problems to special purpose and general-purpose domain

Adopted version from the source: https://www2.deloitte.com/nl/nl/pages/data-analytics/articles/part-1-artificial-intelligence-defined.html

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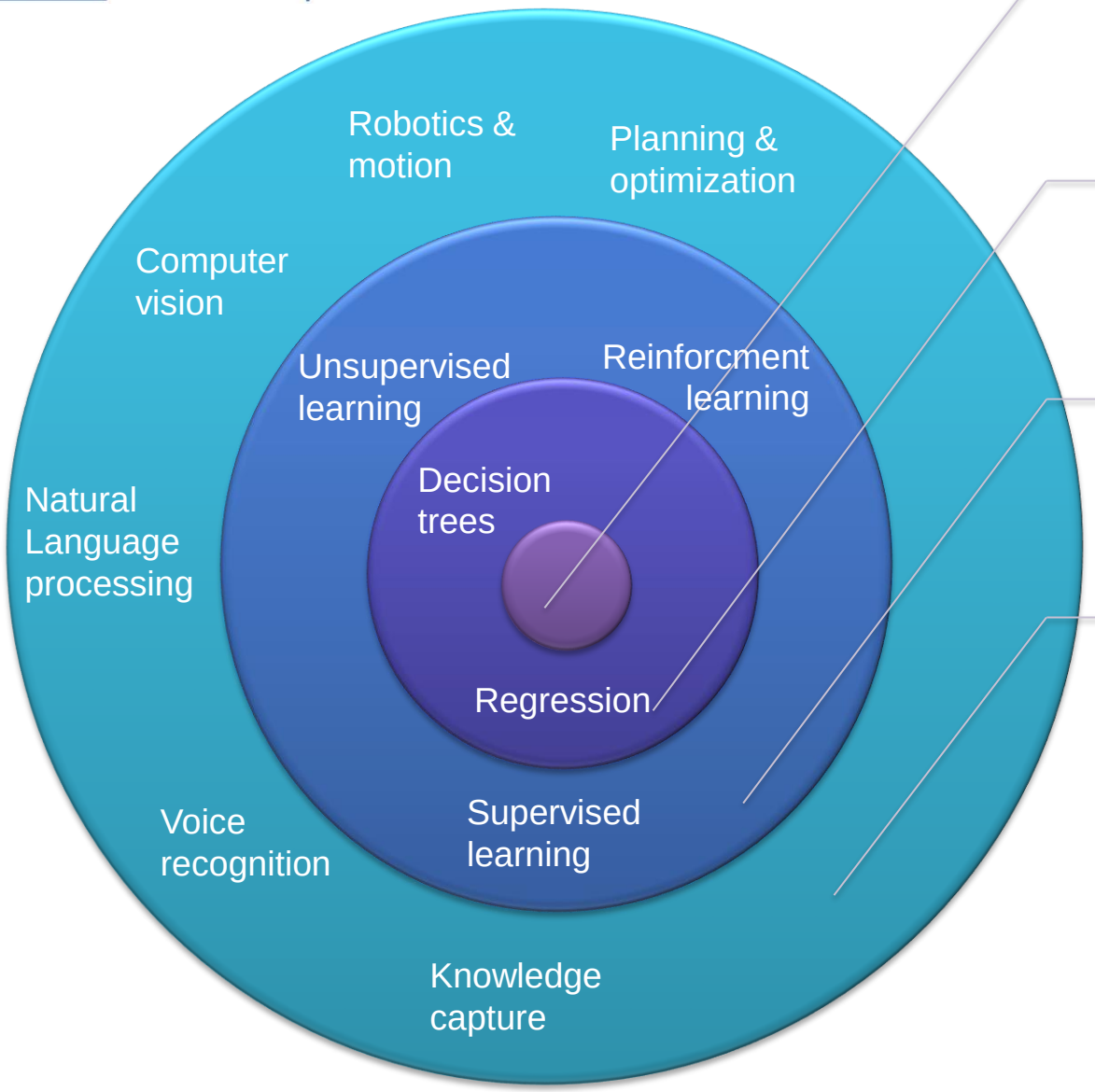

Technologies

- Technical enablement

Methods

- Ability to reason

Machine Learning

- Ability to learn

Artificial Intelligence

- Ability to sense, reason, engage and learn

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Adopted version from the source: https://www2.deloitte.com/nl/nl/pages/data-analytics/articles/part-1-artificial-intelligence-defined.html

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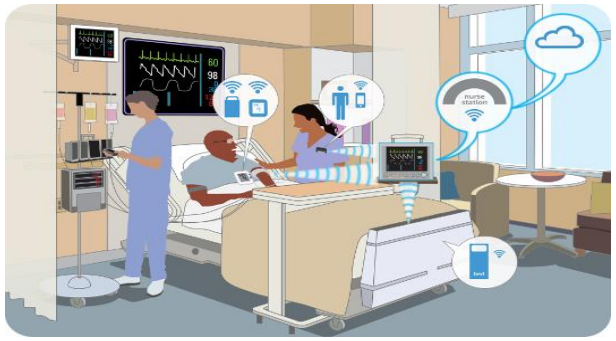
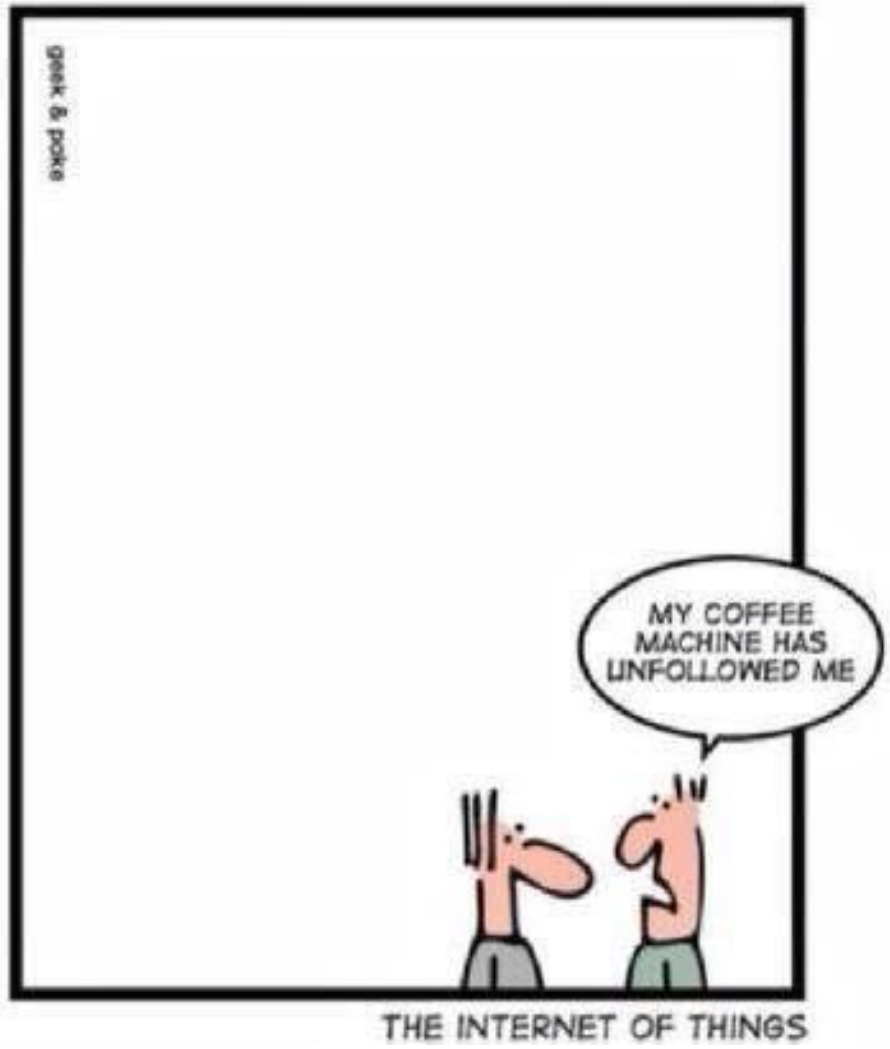
The internet of Things





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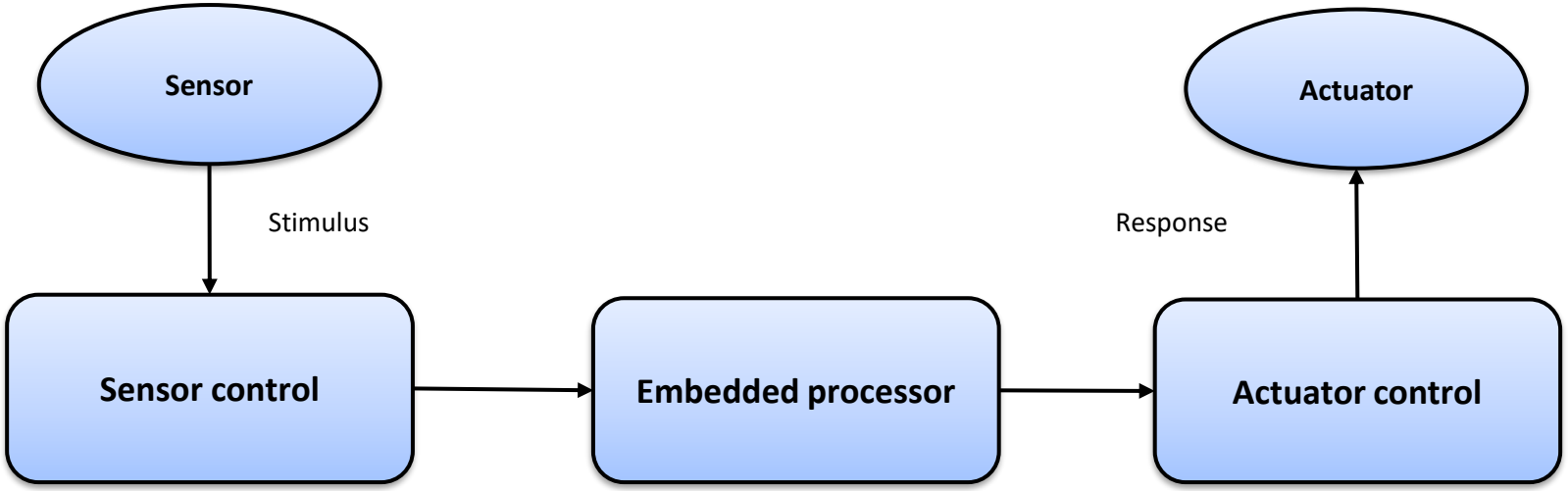
What is an embedded system



Adapted from: Sommerville, I. (2016). Software Engineering. 10th edition. Pearson Education.

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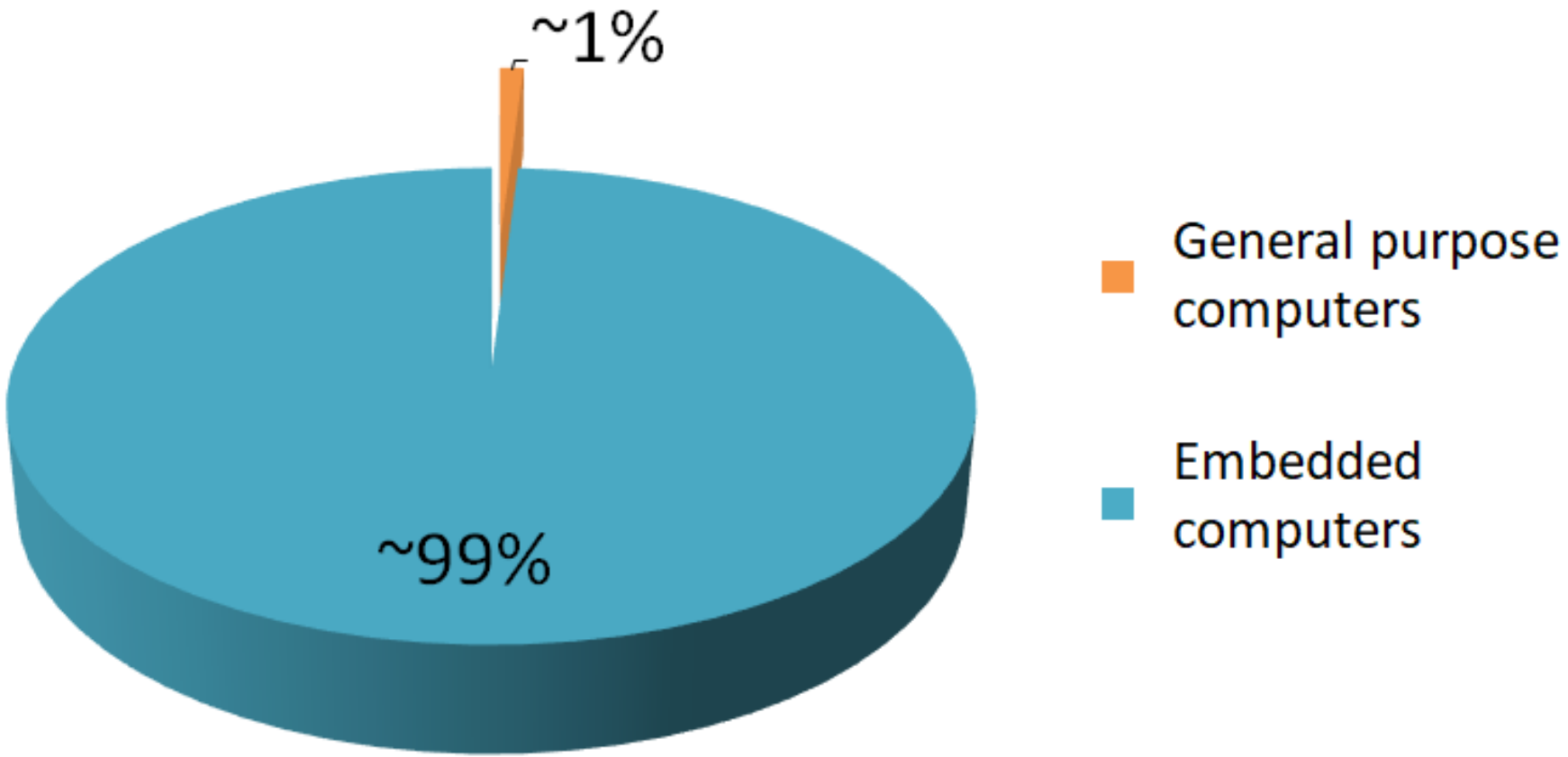
Distribution of embedded systems



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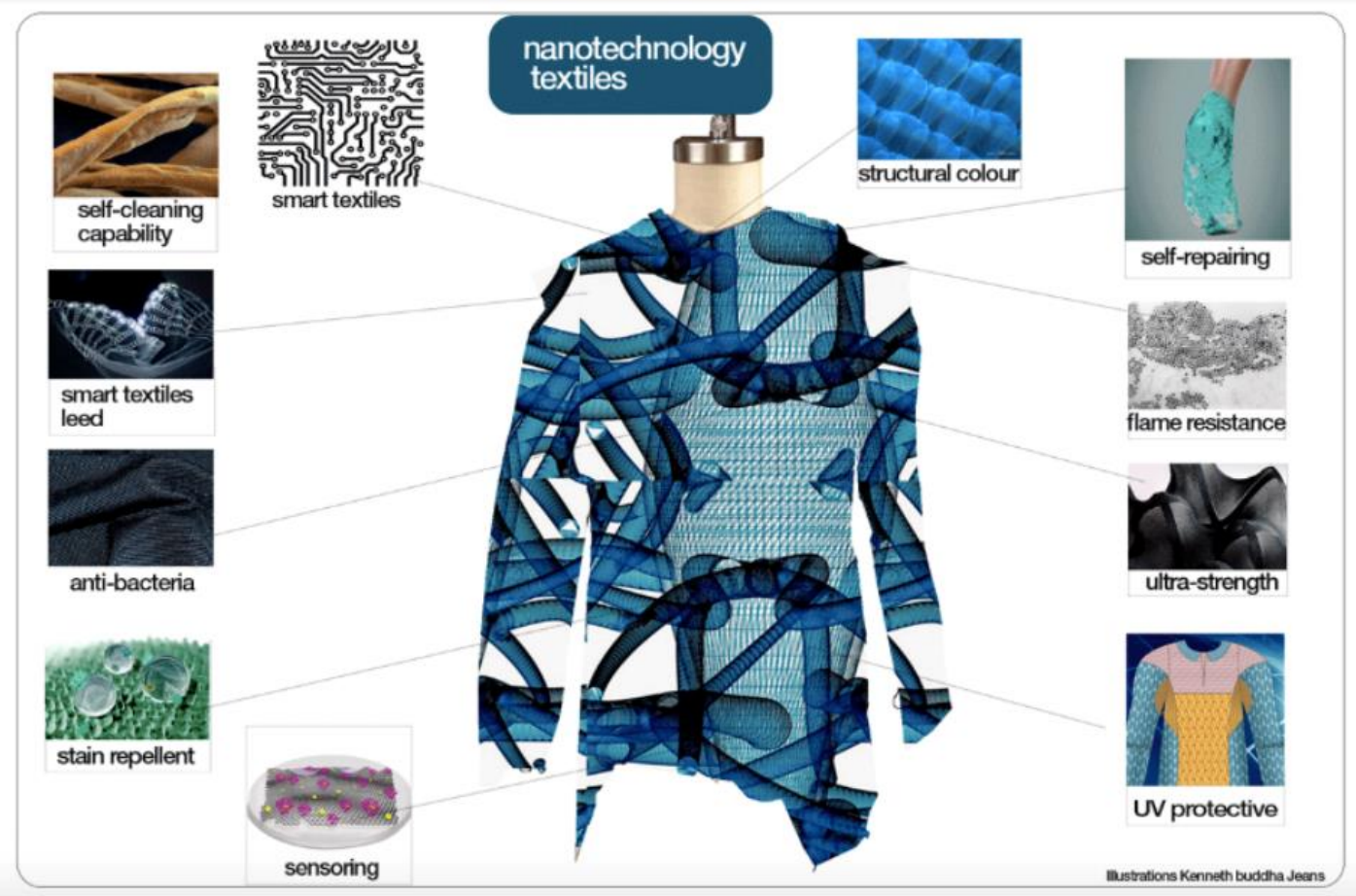
Internet of things (smart textiles)



source: https://www.kaleidoinsights.com/impact-analysis-smart-textiles/

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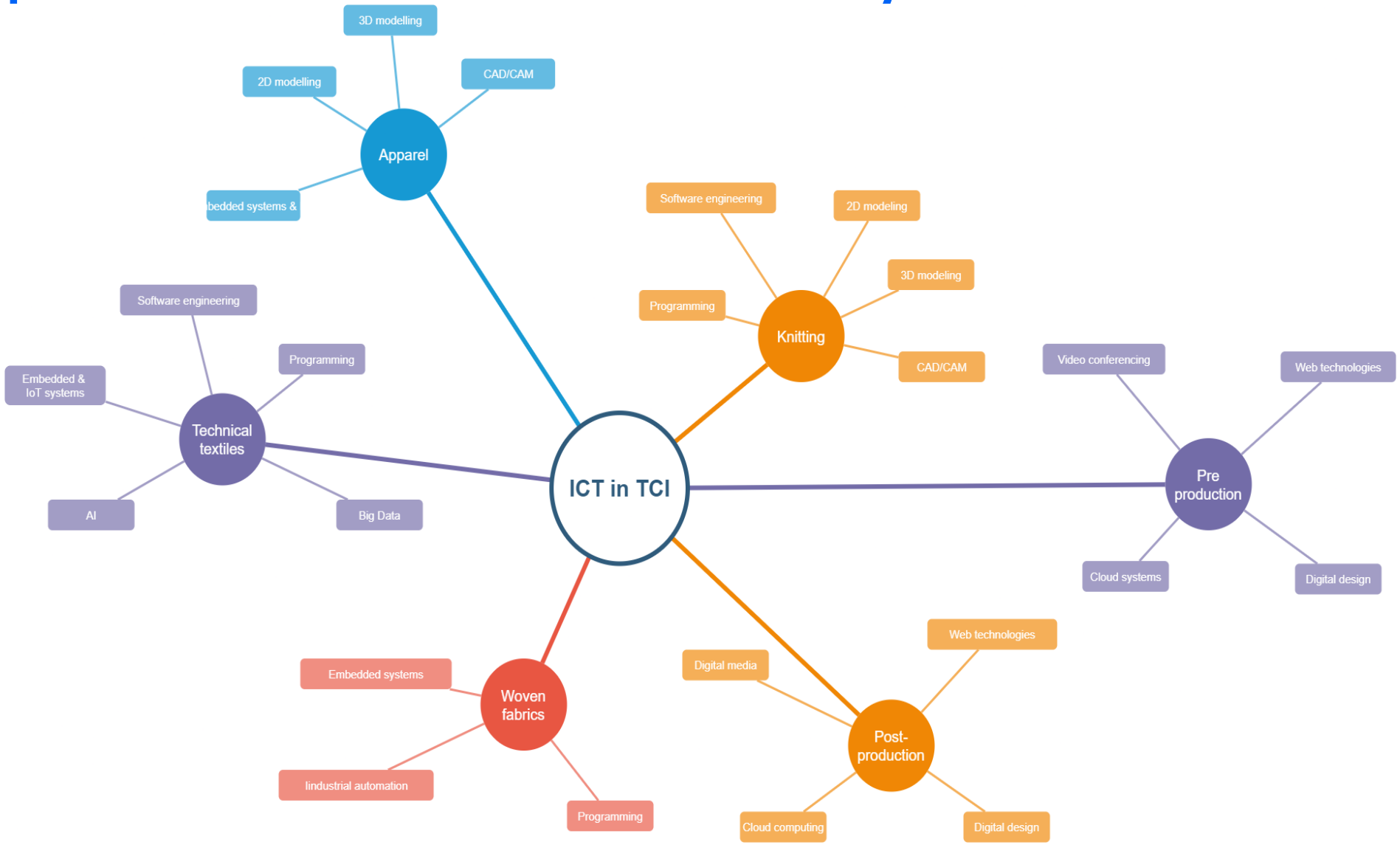
Map of ICT in Textile industry



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Conclusions

- ICT has various application aspects in Textile industry
- Main areas identified for future improvement
  - Cloud systems and Internet of Things
  - Artificial Intelligence, Machine learning and Big-Data
  - Basic programming and requirement engineering skills

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Discussion and Q&A

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