The Fourth Industrial Revolution and Knowledge management
Early stage conceptualisation

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The Fourth Industrial Revolution (4IR)
Timeline and characteristics
The future organization
Knowledge management (KM)
A different understanding and approach
Re-conceptualising tools and initiatives
Reflecting on:

1. The characteristics and timeline of the 4IR
2. The implications for organizations
3. The state of KM
   - The manner in which KM is practised in organisations;
   - Curricula of higher education courses in KM;
   - ISO 301 30401 KM
   - Content of short courses;
   - Maturity of knowledge on KM;
   - KM standards and maturity models.
4. Conceptualising 4IR approaches to KM
“Billions of people and countless machines are connected to each other and data is being collected and harnessed like never before.” - World Economic Forum, 2017
Knowledge management is a 3IR development.
3IR Design principles
The future organization

14 Principles of the Future Organization:
1. Globally distributed with smaller teams
2. Connected workforce
3. Intrapreneural
4. Operates like a small company
5. Focuses on “want” instead of “need”
6. Adapts to change faster
7. Innovation anywhere
8. Runs in the cloud
9. More women in senior management roles
10. Flatter structure
11. Tells stories
12. Democratizes learning
13. Shifts from profit to prosperity
14. Adapts to future employee and manager

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“On the whole, there are four main effects that the 4IR have on organizations”:

- Customer expectations – how customers are served
- Product enhancement – digital capabilities, durable and resilient, predictive maintenance
- Collaborative innovation – new forms of collaboration
- Organizational forms – new business models, different skills and talent

(Bloem et al., 2014)
“Most manufacturers currently only receive a limited amount of feedback on product use and performance from consumers, mainly through returns and complaints.

However, this falls far short of the real-time responses IoT-enabled devices can provide.

With the advent of IoT, manufacturers are now able to gain a level of insight into product design, ordering, fulfilment and transportation that was never before possible.”
Interdisciplinary nature of KM
Traditional way of thinking about KM

Knowledge processes

- Effective management of knowledge resources
- Promoting an enabling environment
- Knowledge processes
- Facilitate knowledge sharing and learning
- Sharing best practices, lessons learned, after action reviews, CoP’s
- Information and knowledge audit
- Intranet and portals
- Records and document management
- Codes of Practice and Standard Operating Procedures
- Expertise locator
# Process Applications

### Knowledge Collection Process

**Operation**
- Improvement Team 1
- Improvement Team 2
- Improvement Team 3
- Improvement Team x

**BU AO / M&T**
- BU AO
- BU AO
- BU AO

**Group AO**
- Central Knowledge databases (compiled improvements, best practices)

**Operation's AO**
- Submits the knowledge to be shared in a standard format (project close out report) to the respective BU AO
- Support data entry on currently progressed improvements

**BU AO**
- Performs a quality check on the submitted content from operations
- Submits the information from the operations or own knowledge (e.g. best practices) in the standard format to Group AO

**M&T**
- Submits relevant knowledge to be shared in the standard format to Group AO

**Group AO**
- Collects all submitted knowledge
- Provides own knowledge to databases (e.g. OR learning, observed best practices)

### Knowledge Dissemination Process

**Operation**
- Department 1
- Department 2
- Department 3
- Department x

**Operation's AO**
- Submits knowledge to relevant stakeholders

**BU AO**
- Filters the received knowledge and submits it to the relevant operations

**M&T**
- Distribute knowledge within respective M&T disciplines

**Group AO**
- Regularly informs BU AO or relevant M&T disciplines about new submissions (distribute via e-mail)
Emerging KM trends

Technology had a tremendous impact on Knowledge management, inspiring the development of robust software platforms to leverage Knowledge management strategies.

- Social media
- Mobile technology and learning
- Search indexing is maturing
- Enterprise collaboration
- Visuals will replace lists
- Social intranet software
- User engagement
- Content creation such as blogs and articles
- Segmentation
- User friendly user interface

(Eisenhauer, 2015)
### Automation of knowledge work

**Exhibit E:** Twelve potentially economically disruptive technologies

<table>
<thead>
<tr>
<th>Technology</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile Internet</td>
<td>Increasingly inexpensive and capable mobile computing devices and Internet connectivity.</td>
</tr>
<tr>
<td>Automation of knowledge work</td>
<td>Intelligent software systems that can perform knowledge work tasks involving unstructured commands and subtle judgments.</td>
</tr>
<tr>
<td>The Internet of Things</td>
<td>Networks of low-cost sensors and actuators for data collection, monitoring, decision making, and process optimization.</td>
</tr>
<tr>
<td>Cloud technology</td>
<td>Use of computer hardware and software resources delivered over a network or the Internet, often as a service.</td>
</tr>
<tr>
<td>Advanced robotics</td>
<td>Increasingly capable robots with enhanced senses, dexterity, and intelligence used to automate tasks or augment humans.</td>
</tr>
<tr>
<td>Autonomous and near-autonomous vehicles</td>
<td>Vehicles that can navigate and operate with reduced or no human intervention.</td>
</tr>
<tr>
<td>Next-generation genomics</td>
<td>Fast, low-cost gene sequencing, advanced big data analytics, and synthetic biology (“writing” DNA).</td>
</tr>
<tr>
<td>Energy storage</td>
<td>Devices or systems that store energy for later use, including batteries.</td>
</tr>
<tr>
<td>3D printing</td>
<td>Additive manufacturing techniques to create objects by printing layers of material based on digital models.</td>
</tr>
<tr>
<td>Advanced materials</td>
<td>Materials designed to have superior characteristics (e.g., strength, weight, conductivity) or functionality.</td>
</tr>
<tr>
<td>Advanced oil and gas exploration and recovery</td>
<td>Exploration and recovery techniques that make extraction of unconventional oil and gas economical.</td>
</tr>
<tr>
<td>Renewable energy</td>
<td>Generation of electricity from renewable sources with reduced harmful climate impact.</td>
</tr>
</tbody>
</table>

**Ten Automatable Knowledge Work Jobs**

1. Lawyer—e-discovery, predictive coding, etc.
2. Accountant—automated audits and tax
3. Radiologist—automated cancer detection
4. Reporter—automated story-writing
5. Marketer—programmatic buying, focus groups, personalized e-mails, etc.
6. Financial advisor—“robo-advisors”
7. Architect—automated drafting, design
8. Teacher—online content, learning diagnosis
9. Financial asset manager—index funds, high-frequency trading
10. Pharmaceutical scientist—cognitive computing for new drugs

*Source: McKinsey Global Institute analysis*
1. Identifying and leveraging skills and competencies that robots cannot “learn”;

2. Identifying and “contracting” sources of knowledge or crowd resourcing;

3. Localising global knowledge;

4. Smart organizations and continuous access to knowledge and creating employee-centric hubs;

5. Sourcing of relevant data and ensuring that data are clean prior to analyses;

6. Ascertaining the relevancy and the value of capturing and sharing experience;
How can KM support organizations in the 4IR

7. Social innovation and sustainability of knowledge;

8. Social networks and empowering the global employee;

9. Ensuring that devices are connected to the Internet of Things and that knowledge can be created from the connectedness of devices;

10. Ensuring the safety and privacy of employees; and

11. Limiting complicatedness as opposed to complexity.
Questions