Presentation of the main workshop results in the plenary session

Peter Seitz, Photonics21 WG5 Chair
WG5 Inspiration – The IoT (Internet of Things) Revolution
IoT Pervasive Solutions ... and a Huge Market

THE TOP IoT GROWTH INDUSTRIES

The primary industrial sectors leveraging IoT that will be at the forefront of disruptive value creation in the global business ecosystem.

Connected Buildings & Smart Homes
Oil & Gas Mining

By 2030, a majority of home devices will connect to the internet. 43% of building managers in the US believe that IoT will significantly affect overall building operations within the next three years. Particular benefits include energy savings, ease of access control, intelligent surveillance and monitoring, improved building operations and support for sustainability efforts.

By 2020, 5.4 million IoT sensors, devices & systems will be used on oil extraction sites to track and measure environmental, performance and productivity metrics. Particular benefits include predictive maintenance & monitoring of drilling equipment and the distribution pipeline network, to ensure safe & efficient midstream operations and workflow automation.

Connected devices in billions

<table>
<thead>
<tr>
<th>Year</th>
<th>Connected Devices (billions)</th>
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<tbody>
<tr>
<td>2015</td>
<td>15.41</td>
</tr>
<tr>
<td>2016</td>
<td>17.68</td>
</tr>
<tr>
<td>2017</td>
<td>20.35</td>
</tr>
<tr>
<td>2018</td>
<td>23.14</td>
</tr>
<tr>
<td>2019</td>
<td>26.66</td>
</tr>
<tr>
<td>2020</td>
<td>30.73</td>
</tr>
<tr>
<td>2021</td>
<td>35.82</td>
</tr>
<tr>
<td>2022</td>
<td>42.62</td>
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<tr>
<td>2023</td>
<td>51.11</td>
</tr>
<tr>
<td>2024</td>
<td>62.12</td>
</tr>
<tr>
<td>2025</td>
<td>75.44</td>
</tr>
</tbody>
</table>
IoT Products: Costs Dominated by Hardware...

Investment in IoT solutions: An exponential growth path

According to current projections:

- A cumulative total of US$6 trillion will be spent on IoT solutions between 2015 and 2020.
- IoT investments by businesses will grow from US$215 billion in 2015 to US$832 billion in 2020, while consumer spending on IoT solutions will rise from US$72 billion to US$236 billion.
- According to IDC, the IoT marketplace will be worth US$1.7 trillion in 2020, with the biggest portion being hardware, followed by services, connectivity and software.

... Where Photonics Plays a Role (Which Could Be Much Increased)

IoT enabled sensors – Segment breakdown forecast for 2022 (Statista 2017)
If Photonics succeeds in the IoT market, it will succeed everywhere!

1. Systems, not components
2. Miniaturization
3. Cost-effectiveness
4. Platforms, not individual solutions
5. AI-empowerment
6. Multi-analytes
7. Maintenance-free
8. Robustness
9. Low Power
10. Eco-Friendliness
11. Focus on high-growth/high-value markets
Main WG5 Proposals for Operable Call Topics

1. Photonics-enabled IoT systems for Personalized Medicine and Environmental Monitoring

2. High-speed hyperspectral VIS/NIR/MIR imaging for security and industrial applications

3. High-performance room-temperature NIR/MIR/FIR sensing solutions