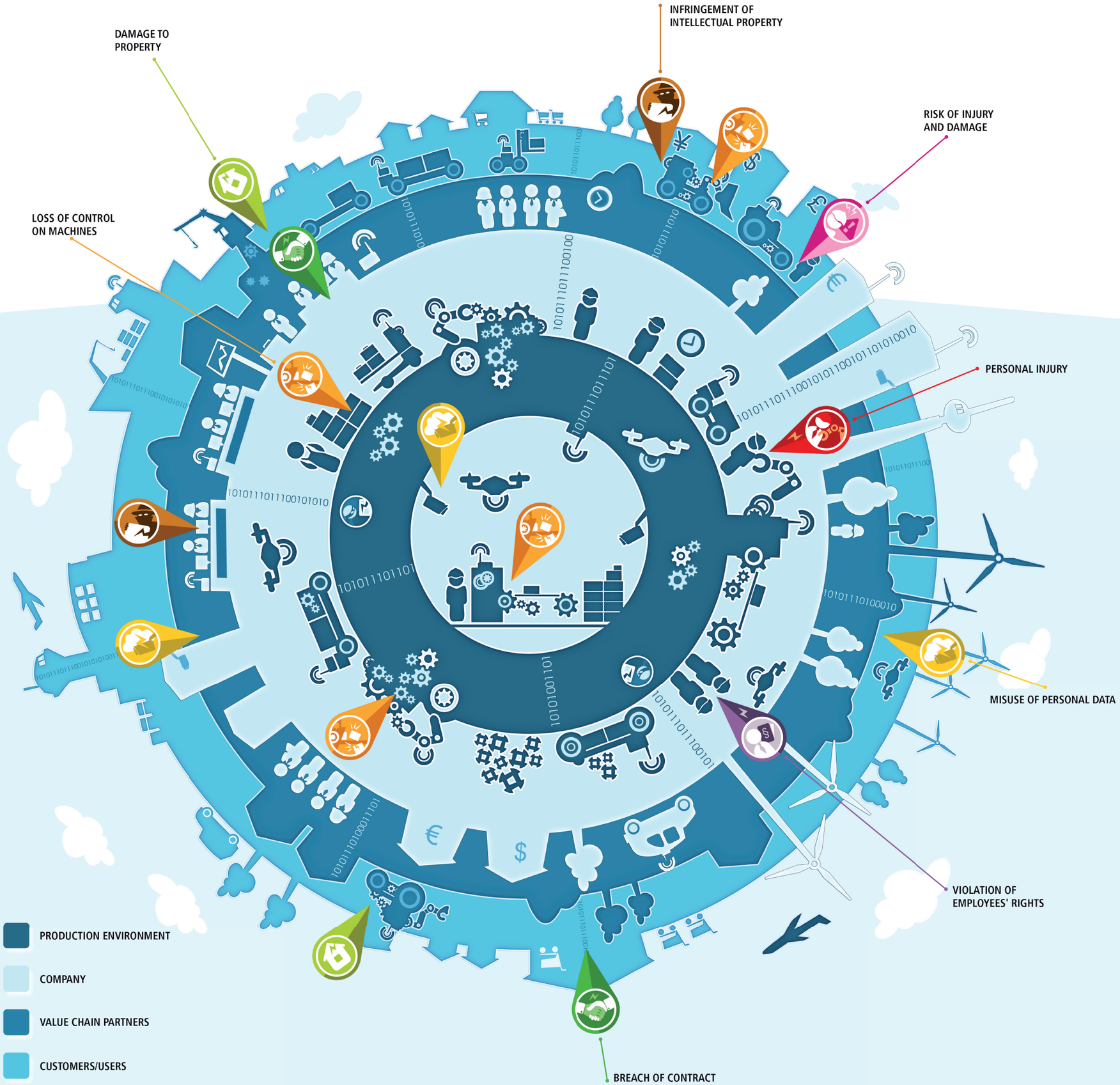
AUTONOMIK
INDUSTRIE 4.0



AUTONOMIK
INDUSTRIE 4.0

Ju-RAMI for Industry 4.0

Legal challenges facing the use of autonomous systems

Elements of the value chain

Production environment
Use of innovative, highly flexible production systems, controlled by ICT technologies and intelligent sensor systems, extensive man-machine interaction

Company
Product development and production planning though the use of IT solutions, use of powerful intralogistics and interlogistics to control internal process flows and interaction between the value chain partners

Value chain partners
A group with members ranging from suppliers to manufacturing partners in digitised network structures

Customers/users
Business model innovations for immediate response to customer requirements and individual requests, high level of transparency regarding the extent to which order products are produced

The position of the elements can be found in the graphic on the next page.

The programme

The „AUTONOMIK für Industrie 4.0" technology programme by the Federal Ministry for Economic Affairs and Energy (BMWi) is going to great lengths to ensure the successful implementation of the federal government's Industry 4.0 Future Project. 14 projects involving around 100 partners from industry and academia have qualified for support by the Federal Ministry which is backing the projects with funding in the order of €40m. Scientific research measures will also address key cross-cutting issues related to IT security, the future of work in Industry 4.0, standardisation and legal issues. Who is liable when an autonomous vehicle damages another vehicle or even injures someone? Which legal issues will manufacturers of mobile robots have to face with a view to approval for their autonomous products? Which industrial protection and data protection guidelines make sense and are practical for the use of autonomous systems? An early analysis of the legal context can help to avoid potential risks. As a tool developed in this cross-cutting topic, Ju-RAMI 4.0 offers stakeholders in Industry 4.0 projects an immediate framework for orientation which will help them to identify existing legal loopholes while offering first approaches for a solution.

For more information, go to:
www.autonomik40.de and www.ju-rami.com

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Uwe Seidel/Eric Hilgendorf
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seidel@iit-berlin.de

Editing/design
LoeschHundLiepold
Kommunikation GmbH
Hauptstraße 28 | 10827 Berlin
autonomik@lhlk.de

www.autonomik40.de

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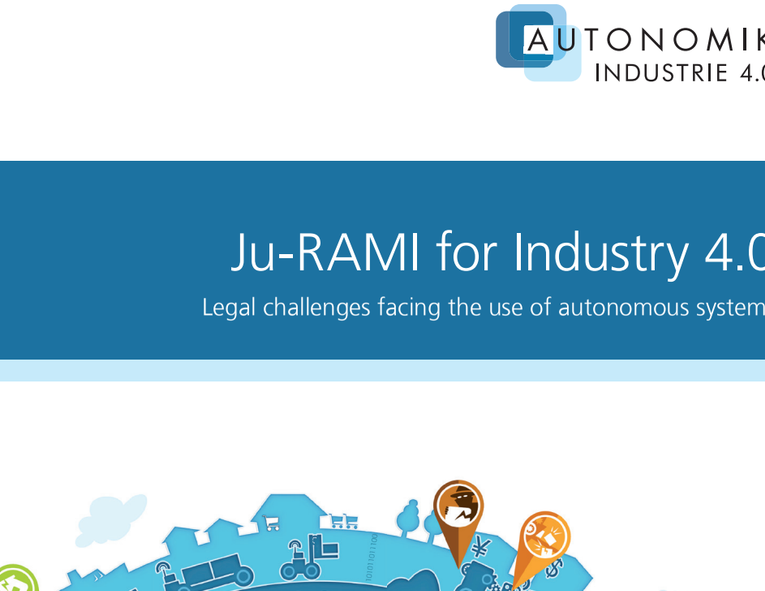
Legal challenges facing the use of autonomous systems

Scientific research as part of the „AUTONOMIK for Industrie 4.0" (in English „AUTONOMICS for Industry 4.0") technology programme is addressing important cross-cutting issues related to IT security, the future of work in Industry 4.0, standardisation, business models and legal frameworks. Data protection and IT security are just as important here as are issues of liability, e.g. in accident scenarios.

But often the questions (especially the legal ones) being asked are new and complex so that the technicians working in the projects have difficulty understanding them and putting them into the right perspective. They have to be able to state whether or not the system or product developed by them could come into conflict with legal norms or violate applicable law.

The first version of a „legal" reference model for Industry 4.0 should make it easier to understand the legal risks inherent in digital production. „Ju-RAMI 4.0" is designed to allow people who are not versed in the law to identify specific legal risk areas, damage and hazards across the entire value chain. Just like the RAMI 4.0 reference architecture model, Ju-RAMI 4.0 comprises a three-dimensional coordinates system that maps the key areas of law and legal risk areas in conjunction with „AUTONOMIK für Industrie 4.0" along the value chain. The aim is to help industry 4.0 project stakeholders to identify existing legal loopholes and to offer first solutions to these problems. The individual legal layers are filled with practical case examples. The infographic on the next page provides a simplified overview.



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Legal risk areas

Personal injury
If people are injured, this is referred to as personal injury. These injuries can range from minor to fatal.

Damage to property
Damage to property can apply to all kinds of things. A „thing" is defined by law as any corporeal object (section 90 of the German Civil Code), i.e. anything that you can touch. This includes machines as well as the (physical) products produced by them, utensils, as well as clothing worn on the body. The human body itself and its parts are not things.

Breach of contract
A breach of contract is when a contract was made and entered into between two or more contract parties with mutual rights and obligations and one of the parties to the contract fails to fulfil its obligations under the contract. A breach of contract does not have to be intentional.

Misuse of personal data
Personal data is data that refers to the personal circumstances of a specific or identifiable person. Such data may only be collected, stored or processed with the express consent of the person in question or if such collection, storage or processing is foreseen by law.

Loss of control on machines
Machines normally run according to defined patterns. This applies not just to mechanical devices, but also to computers that work on the basis of algorithms. Autonomous (computer) systems also work according to rules defined by their creators and programmers. A loss of control is when these rules are no longer observed and returning to the original rule-based status is extremely difficult or not possible at all.

Violation of employees' rights
Employees are not only entitled to payment of the agreed wage, but must also be protected in many ways at the company. This includes observing certain safety standards and maximum working hours, as well as co-determination and other participation rights which employees can claim especially through the works council.

Risk of injury and damage
A risk of injury or damage must be assumed if a situation exists that makes the occurrence of damage or injury likely. The likelihood of damage or injury occurring can differ, ranging from a minimum risk to a hazardous situation in which the likelihood of injury or damage is almost certain.

Infringement of intellectual property
„Intellectual property" is understood to be any results of intellectual work that are protected by law. Intellectual property can refer to special knowledge, inventions and other intellectual creations.

The positions of the icons can be found in the graphic on the next page.