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Artificial Intelligence & Internet of Things: Background and Current Legal Issues

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Introduction / Basics

What is the Internet of Things (IoT)?

The Internet of Things (IoT) is the network of physical devices (or objects or "**things**") embedded with electronics, software, sensors and network connectivity that enables these devices to collect and exchange data.

Each **thing** is uniquely identifiable through its embedded computing system but is able to interoperate within the existing internet infrastructure.

Before…
Connection of **things** …
to the web

Now…
Connection of **things** …
to other **things**

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IoT is driving digital disruption of the physical world

Accelerating advances in technology

- Cognitive analytics
- Cloud computing
- Pervasive connectivity
- Product lifecycle management
- Embedded sensors

Are transforming every part of business

- Boosting operational performance and lowering costs
- Driving engagement and customer experience
- Creating new products and business models
- Advancing environmental leadership

Beyond analytics → true cognitive: Expand what's knowable: Four APIs are unlocking new insights from new data

Natural language processing

Enables interaction through natural human language and dialog

Machine learning

Automates data processing and continuously monitors new data to learn and improve results

Textual analytics

Enables mining of textual sources to find correlations and patterns in these vast amounts of untapped data

Video/image analytics

Enables monitoring of unstructured data from video feeds and image snapshots to identify scenes and patterns

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Elements of Artificial Intelligence (AI)

- **Negative/positive definition: What is not (necessarily) AI and what is AI?**
- **Collecting, storing and processing data**
  - **Automated thinking**
  - **Constant thinking**
  - **Controlled thinking**
  - **Application of knowledge and skills**
  - **Empirical learning**
  - **Cross-linked thinking**
  - **Developing new possibilities/opportunities**
  - **Decision-making**
  - **Solving of complex problems**
- **Awareness, even consciousness? Not for the time being**
- **Self-reflexive thinking, learning, teaching? Not for the time being**

- **Accountability vs. responsibility: AI is a tool (a "cognitive system")**

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Artificial Intelligence (AI), e.g., IBM Watson

A cognitive computing platform that revolutionizes the way people and computers interact.

Natural language processing:

- Watson understands natural language the way humans use it.
- Watson will answer questions in natural language, the way humans do.

Textual/video/image analytics:

- Watson can ingest unstructured information such as text documents.
- Increasing capabilities in image processing.

Hypotheses generation:

- Watson generates hypotheses and provides suggested answers questions quickly.

Machine learning:

- Watson can be taught, it learns from its interactions.
- Knowledge-driven analytics
- Data-driven analytics
- Combined data-driven and knowledge-driven analytics

What is Watson? (II)

Analytics and insights capability falls into 3 types:

Knowledge-driven analytics:
e.g., Watson on Jeopardy!

Data-driven analytics:
e.g., pattern recognition in image and text data, modeling disease progression from medical claims data.

Combined data-driven and knowledge-driven analytics:
how knowledge (what publications and experts tell us) and what can be extracted from data complement each other to arrive at accurate predictive modeling.

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Introduction: New paradigm – collaborative/interactive approach

- IBM has transformed into a cognitive solutions and cloud platform company
- IBM has entered markets where its solutions may
  - interact more directly with the physical environment of clients or end users (e.g., AI/IoT offerings), or
  - may go beyond traditional "back-office" IT offerings to more directly assist clients with high risk activities (e.g., cognitive assistance for health care or other decision support applications in industries such as aviation or automotive)

- Certain uses of cognitive solutions can create a significant risk of personal injury
- Risk of personal injury associated with these offerings must be thoughtfully assessed
- Things to consider
  - Cognitive solutions can be subject to abuse or inappropriate use by end users or can be hacked or otherwise misused by third parties causing personal injury
  - potential for legal liability and costs for cognitive solutions provider to defend and remediate for personal injury caused by cognitive solutions in high risk activities can be substantial, and
  - reputational risk for cognitive solutions provider can be even greater than legal liability and remediation costs

IP Ownership & Licensing in IoT and AI

Questions and things to consider:

- Who owns rights in data generated by IoT devices?
- Be mindful of obtainable IP rights: Who claims intellectual property rights in the data?
- Ownership rights in the information derived from the data?
- Do you reserve the right to transfer the data?
- Multi-jurisdictional contracts necessitate cross-border expertise: Have you evaluated your contract/notice under the laws of all countries in which you do business?
- **Can an AI system create a copyrightable work, is device data copyrightable?**
- **Other IP, otherwise protectable?**

!! Contracts should be clear, especially on issues of ownership, right to use and other aspects of managing data, metadata and what can be learned from data and metadata !!

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Copyright Law

- Protection of AI as such
  - **Algorithm (idea) vs. software (expression): Protection is granted to the expression of the code but not to its functionalities**
  - **Intellectual creation: Human developing**
  - **Individual work: Somebody else would have done it differently…**
  - **It's me, the creator: Moral rights**
- Protection of product of AI
  - **Many national copyright laws grant copyright protection only to works created by humans.**
  - **On the other hand, for computer generated work, certain copyright laws (the UK copyright law is an example) deem the "person by whom the arrangements necessary for the creation of the work are undertaken" as the author enjoying copyright protection of the computer generated work.**
  - **No case law, but this regulation could mean that the <u>person operating the computer is deemed to be the author of the computer generated work</u>. This is the appropriate way to address the problem and to ensure that computer-generated work enjoys copyright protection.**

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Patent Law

- Protection of AI as such
  - **Invention as a technical rule: Software with a technical effect, not “software as such” (art. 52 European Patent Convention)**
  - **Novel: Current status of technology – inventive step**
  - **Non-obvious: For an expert in relation to current status of technology**
  - **Only technical elements are patentable, no patent protection for pure programming routines**
  - **Disclosure and practicability: Description of the invention so that it can be replicated**
  - **Role of the inventor, the inventor must be identified**

Patent Law (II)

- Protection of product of AI
  - **Only humans can be inventors in the sense of patent laws and only a person can acquire the right to file a patent application.**
  - **No particular cases analyzing under which conditions humans interacting with cognitive systems might be considered the inventors of technical teachings created with assistance of cognitive systems.**
  - **The state of discussions in certain jurisdictions could be interpreted to mean that to be considered an inventor it is not required that the human "create" some technical teaching. <u>To be deemed a (co-) inventor, it might be sufficient to "recognize" in some material a technical teaching that solves a technical problem.</u>**
  - **With this approach, a cognitive system can be considered the (scientific) tool (like any other tool helping an inventor to get to an invention) providing some output.**
  - **The human recognizing a technical teaching within such output would be deemed the inventor for such an invention.**

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IP ownership & licensing (Watson IP principles)

IBM	Client
• IBM owns all IP to Watson Core. • IBM owns all IP to Cloud Infrastructure. • IBM owns all future enhancements to the Watson Core and its Cloud Infrastructure. • IBM needs full freedom of action for future Watson engagements. • IBM will not use Client's exclusive content or Client's IP for any other purpose without Client's consent.	• Client will own the copyright in any deliverables (usually documents) subject to IBM ownership of embedded IBM pre-existing materials (document templates). • Client will have a perpetual license to the embedded pre-existing templates. • Client will retain "ownership" of the content it provides. • Client will own its pre-existing IP (and any derivatives) and its proprietary information.

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Typical IP discussions in a Watson deal

- ✓ Watson is delivered under IBM's standard cloud terms – with predefined operational and security terms and must be on IBM standard terms.
- ✓ Understand IBM's investment in Watson & what Watson is; IBM must retain freedom of action to ensure repeatability of offerings and our people.
- ✓ Articulate how the client will access Watson.
- ✓ **Client "owns" its data (content) and copyright in insights developed from cognitive analysis of client data; IBM owns Watson and enhancements to the platform.**

IBM must maintain full ownership and control over the Watson platform. To give ownership or control of any part to a client would result in multiple versions of Watson ("forking" the platform), which cannot be sustained.

IBM will not re-use a client's private data used to train or operate a specific instance of Watson (without permission) and, if an instance has been specifically trained for a client on the client's private data, IBM will not re-use that instance if it relies on the client's private data**.** However, **IBM must remain free to deploy Watson with its other clients**, who may be able to develop similar or identical insights using different data, including their own private data.

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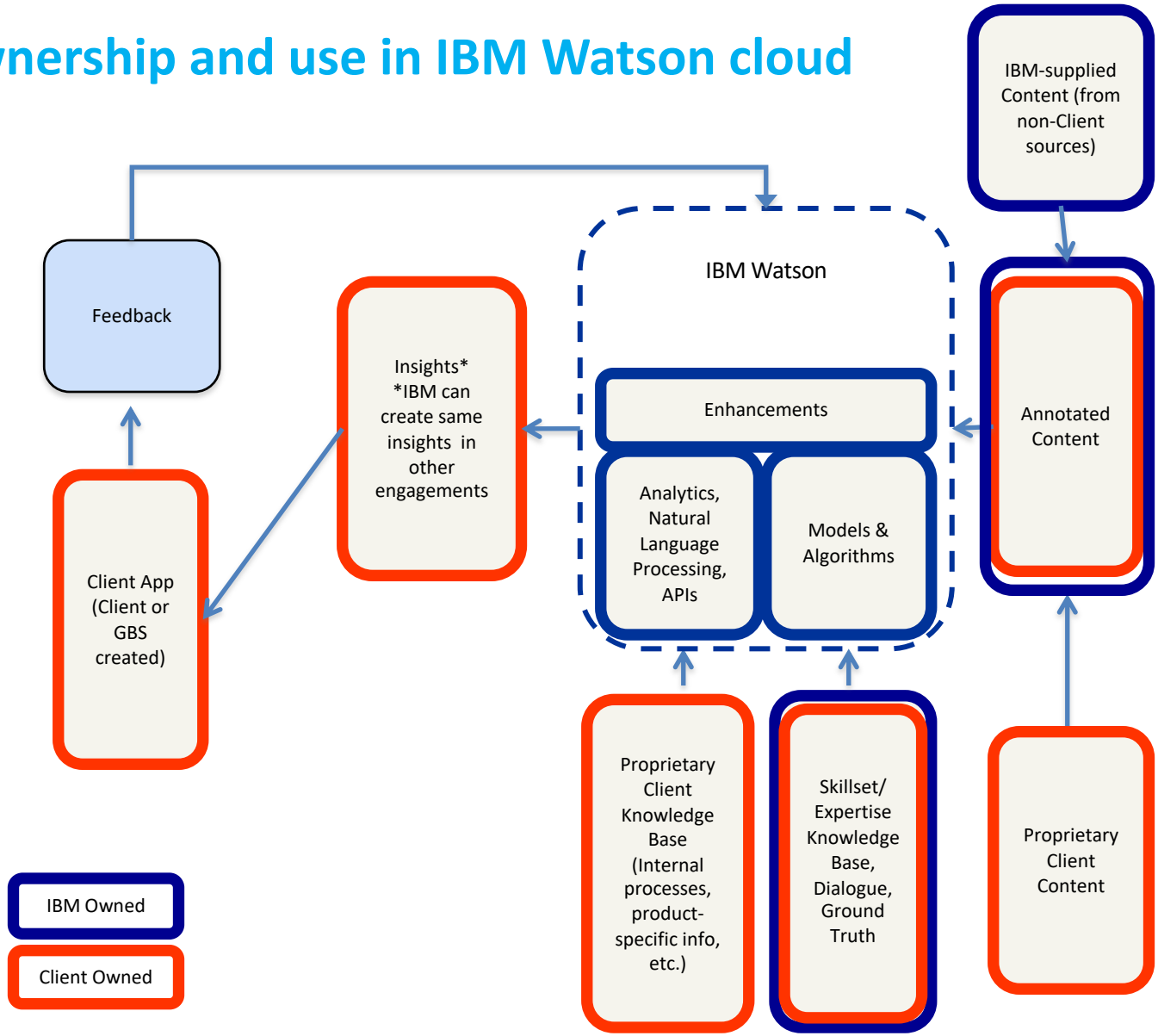
IP Ownership and use in IBM Watson cloud



Data Allocation/Exclusivity ("Ownership")

- Who owns rights in data generated by IoT devices?
- The US Driver Privacy Act of 2015 states that "any data in an event data recorder required to be installed in a passenger motor vehicle (as provided for under US Department of Transportation (DOT) regulations concerning the collection, storage, and retrievability of on-board motor vehicle crash event data) is the property of the owner or lessee of the vehicle in which the recorder is installed, regardless of when the vehicle was manufactured."
- Based on the assumption that such data belongs to the owner of the vehicle, various state statutes impose restrictions on the use of such data, e.g., that such data may not be used without the owner's consent or a court order.
- Of course, the owners of data can contract away rights. Facebook users grant Facebook a non-exclusive, transferable, royalty-free, worldwide license to use their photos, videos and other content.

Data Allocation/Exclusivity ("Ownership") [II]

- Facebook extracts value from analyzing users' content and adding metadata to user profiles, particularly metadata concerning users' demographics and consumption – so that ads can be targeted more effectively.
- Internet users create metadata every day simply by sending messages with particular "re lines" to particular people at particular times. Or by moving around with their cell phones.
- It is much less clear who "owns" the metadata that is partly created by the user and partly created by the system that transfers the content.
- Bear in mind that some specific types of data are protected when they have unique identifiers that are sufficient to identify a specific person.
  - See "In re Hulu Privacy Litigation", USDC, N.D. California (2015): District court rejects Video Privacy Protection Act claim against video streaming provider Hulu, finding insufficient evidence that Hulu knowingly disclosed to Facebook information identifying its users as having requested or obtained specific video materials through Hulu's embedded "Like" button feature.

Data Allocation/Exclusivity ("Ownership")

Things to consider with industrial IoT data:

- What data/metadata will the device/system generate when placed in use by customer?
- Will the device/system generate, transmit and store telematics data regarding its performance, condition, location, etc.?
- How much of the data, metadata will be sent to you?
- What will you do with the data/metadata?
  - Use it to provide ongoing service/update?
  - Use it to propose service/update?
  - Analyze it to improve product/service, create new product/service? etc.
- Will you anonymize the data?
- Will you aggregate the data?
- Will you provide the data to third parties? For what purpose?
- How long will you keep the data?
- Do you claim ownership of the data or request a license? What about information derived from the data?

Anonymization of personal data

- Anonymization is becoming increasingly ineffective in the world of **big data**
  - Examples where it has apparently been possible to identify individuals in anonymized datasets
  - Recent MIT study looked at records of 3 months of credit card transactions for 1.1 mio people and claimed that, using the dates and locations of 4 purchases, it was possible to identify 90 percent of the people in the dataset
- It may not be possible to establish with absolute certainty that an individual cannot be identified from a particular dataset, taken together with other data that may exist elsewhere
- The issue is not about eliminating the risk of re-identification altogether, but whether it can be mitigated so it is no longer significant
- Organizations should focus on mitigating the risks to the point where the chance of re-identification is extremely remote
- The range of datasets available and the power of big data analytics make this more difficult, and the risk should not be underestimated. But that does not make anonymization impossible or ineffective.

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Thank you

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