Legal Challenges of Wearable Computing

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Introduction*

"You could wear a pair of glasses with a small amount of face recognition built-in, look at a person, and his name would pop up in a balloon above his head. You could know instantly who the person is, even if you don't immediately recognize him. I look at my tree, and a little balloon pops up saying 'Water me,' I look at my dog, it says, 'Take me out,' or I look at my wife, it says, 'Don't forget my birthday!'"¹

What had been described as a vision and fiction only a little more than a decade ago, has become reality with the recent arrival and sale to the public of Google Glass.² In Gartner’s hype cycle of emerging technologies for 2014, wearable devices (also referred to as "wearables") have just passed the "peak of inflated expectations" and are expected to reach the "plateau of productivity" within the next 5-10 years.³

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³ http://www.gartner.com/technology/research/methodologies/hype-cycle.jsp (all hyperlinks to URLs in this paper have last been visited on April 30, 2014).

¹ I am very grateful to Anne-Catherine Cardinaux, MLaw, and Bernhard Eymann, MLaw BA, who have provided me with invaluable support and assistance in the research and review of this paper. Any errors or omissions within this paper are solely mine.
Wearable technology is yet another step in the field of miniaturization and personalization of technological devices, greatly enhancing multidirectional interaction between humans and machines in various ways. Due to the increasing number of wearable devices available for mass markets, wearable computing has already gained significant economic importance and will continue to do so in the foreseeable future.

Wearable computing brings along a number of legal challenges which may not have been totally unseen so far, but will have to be dealt with on new scales and within new dimensions.\(^4\) Legal issues related to data protection, product liability, and regulatory aspects are most prominent. This paper addresses these topics, discusses the challenges with regard to adapting the legal framework, and attempts to provide thoughts and solutions serving as technology enablers by creating awareness, trust and acceptance for emerging technologies. The author takes a multi-jurisdictional approach on these issues and the paper is therefore rather based on generally acknowledged legal principles and thoughts than on the statutes of a specific jurisdiction.

1. Fundamentals of Wearable Computing

a) What is Wearable Computing?

Wearable computing may be defined as "the study or practice of inventing, designing, building, or using miniature body-borne computational and sensory devices. Wearable computers may be worn under, over, or in clothing, or may also be themselves clothes." In addition, wearable devices may also be built into the body itself and in this way become part of it.

Wearable computing may be considered as the most recent and specific development of the earlier and more general concepts of ubiquitous and pervasive computing.

b) Characteristics

Wearable computing may be characterized by a number of specific properties. These characteristics always need to be kept in mind when looking at the legal challenges raised by wearables. The following non-exhaustive list will describe the most important of these properties:

- As the term implies, wearable computing is about devices worn on or even in the body. Such devices always

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6 Dvorak (footnote 4), at 46/47.
stick together with their "owner" and follow him or her everywhere. It may not be easy – and sometimes even impossible – to remove a wearable device.

- Wearable technology is about *personal devices*. Whereas portable and mobile devices such as tablet computers may be shared among several users, wearable devices are typically related to, and may even be specifically designed or adapted for, one single person – or would you want to share your artificial pancreas\(^7\) with somebody else?

- Wearable technologies are normally *not fixed to a particular location* (unlike surveillance cameras, e.g.), but rather to a particular individual.\(^8\) Wherever this individual goes, the wearable device is, like a shadow, on the same track.

- Wearables are *constantly operating* or at least ready to operate. Unlike other devices which may only be used during working hours or day time, wearable technology works 24/7, including night, weekend, holidays etc. Wearable systems may even be in operation during very

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\(^7\) For examples see below p. 8 et seq.

personal or intimate settings, e.g. when taking a shower.\textsuperscript{9} This steady operation and monitoring is sometimes referred to as "life logging".

- Wearable technology is \textit{highly attentive to its environment}. It's not just there, but it monitors and observes its context (e.g. location), collects information (e.g. biomedical parameters) or records its surroundings, resulting in vast amounts of data. Such activities performed by wearable devices are often non-obvious to their wearers and even less to others.

- Wearable technology is typically \textit{unrestrictive and non-monopolizing}. As a key feature, the use of wearable devices does not substantially limit the mobility of its wearer, nor does it prevent other simultaneous activities.

- Finally, wearable technology is designed not only to monitor the environment and collect and process data, but also to interpret such data and to take decisions on behalf of the wearer of such technology. While such \textit{decision autonomy} may result in increased user comfort, it also implies a loss of control.

\textsuperscript{9} Robert Scoble, \textit{Yes, Google Glass Survives a Wet Shower} (available at \url{https://plus.google.com/+Scobleizer/posts/TcaqNeYJWXo#vScobleizer/posts/TcaqNeYJWXo}).
c) Categories and Examples

The number and variety of wearable devices, already huge as of today, is expected to grow further in the next couple of years. Every attempt to categorize wearable technology may therefore only be considered as a snapshot with limited validity. Having said this, the following categorization of wearable devices may still help first, to identify legal issues applicable to wearables in general and second, to distinguish them from issues relating to one or few categories of wearables only:

- **Gaming and lifestyle devices** build a first category. These devices are mainly designed to render life more comfortable and to facilitate certain activities. Google Glass is the most prominent current device in this category.\(^\text{10}\) Other examples include wearable input gears such as Fin\(^\text{11}\) which facilitates the control and operation of electronic equipment, clothes equipped with digital displays\(^\text{12}\), or wristbands using heartbeats instead of passwords for user authentication.\(^\text{13}\)

- **Safety and prevention products** mainly serve to increase the wearer’s security and to prevent the user from incurring harm or damage. Protective gear and special equip-
ment used by firefighters are typical examples.\textsuperscript{14} Other fields of application include monitoring devices such as the Owlet smart sock for babies\textsuperscript{15}, used for remote preventive supervision of babies’ oxygen rate, skin temperature, heart rate etc.

- \textit{Sports and fitness devices} are considered a third category. Numerous rather basic devices monitoring and measuring parameters such as heart rate\textsuperscript{16}, speed, distance, and more elaborate gadgets such as Push\textsuperscript{17}, a device worn to meter power, force and velocity in strength training and to improve the efficacy of work out sessions are, or will soon be, available on the market.

- Last but not least, a tremendous number of wearable devices is targeting at \textit{wellness and health care}. The fields of application range from elementary tools for the metering of heart rate or blood pressure\textsuperscript{18} to highly sophisticated devices used to alleviate physical diseases and handicaps, e.g. an artificial pancreas\textsuperscript{19}, or contact

\textsuperscript{15} \url{http://www.owletcare.com}.
\textsuperscript{16} E.g. \url{http://www.lumafit.com}.
\textsuperscript{17} E.g. \url{http://www.pushstrength.com}.
\textsuperscript{18} E.g. the health communicator Sensogram, continuously reading, storing and transmitting vital signs and other biomedical parameters (www.sensogram.com).
\textsuperscript{19} E.g. \url{http://www.pancreum.com}. 

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lenses monitoring the blood glucose level for diabetes patients.\textsuperscript{20}

As may be easily seen from the examples above, the borders between the described categories are blurred. A specific device may well fall into one or another category, depending on its specific use. To give an example, Google Glass may primarily be recognized as a lifestyle device to record audio and video sequences. However, if Google Glass is used as a context recognition device for visually challenged people, it falls rather into the category of health care devices.

\textbf{d) Economic Importance}

The economic importance and market relevance of wearable technology is not easy to assess. Although extensive market research has been undertaken in this area, the published figures on current and forecast turnover vary significantly, mainly due to different market definitions and segmentations.

This being said, there appears to be a broad consensus among researchers and analysts that today’s global market for wearable devices accounts for a one-digit billion US dollar figure in terms of turnover. For the next 3-5 years, yearly increases of 30-80\% are forecasted, resulting in significant two-digit

\textsuperscript{20} See for example http://www.telegraph.co.uk/technology/google/10578729/Google-reveals-smart-contact-lens-prototype-designed-to-aid-diabetics.html.
billion US dollar turnovers by 2018. By that time, wearable technology is predicted to account for a nearly 10% share of the global electronics market.\(^{21}\)

The market for wearable technology will most likely be dominated by today’s established and major technology providers, such as Google\(^ {22}\), Apple or Motorola. But it also offers great market entry opportunities for startup and venture companies; one example of a success story is Bragi, a recently established company which developed Dash, the world’s first wireless smart in-ear headphones, and which became Europe’s most successful crowd funding campaign ever.\(^ {23}\)


\(^{22}\) The anticipated market potential of Glass has driven Google to open its first Glass flagship retail store in Soho’s Greene Street, one of New York’s most high-end shopping miles soon (see http://www.cainsnewyork.com/article/20140310/REAL_ESTATE/140319988/greene-street-turns-to-gold-with-potential-new-tenant).

2. Legal Issues Related to Wearable Computing

Interestingly, legal issues were for a long time not considered as an user acceptance factor of major relevance for wearable systems; instead, emphasis has been put on criteria like wearability, ease of use, design, functionality, and price.\(^{24}\)

This attitude has substantially changed in the meantime due to the generally increased awareness of privacy issues. While data protection may be considered being the most crucial challenge and obstacle faced by wearable technology, other legal issues exist.

This section mainly addresses privacy issues. It also covers specific further legal areas, namely product liability and safety, and regulatory issues. However, considering more legal challenges which may arise in the context of wearable computing, such as questions of private international law, intellectual property law or criminal law\(^ {25}\), would go beyond the scope of this paper.

\(^{24}\) Dvorak (footnote 4), at 18/19.

\(^{25}\) E.g. whether unauthorized audio or video recording may constitute a criminal offence.
a) Data Protection

Due to its characteristics\textsuperscript{26}, wearable computing goes along with many challenges and threats to data protection.

To begin, one has to ask \textit{whose data is actually concerned} by wearable technology. On the one hand, data of the wearer of such devices will be processed; on the other hand, personal data of third parties may be involved.\textsuperscript{27} The distinction is important mainly for one reason: Data processing activities undertaken by wearable devices can be justified in most jurisdictions by the individual's consent which may be express (e.g. by opting in) or implied.\textsuperscript{28} Such (informed) consent can normally only be given by the wearer and user of a wearable device, not by third parties who often may not even be aware of their personal data being processed.\textsuperscript{29} Therefore, whenever wearable devices are in place, one has to take into consideration not only the wearer's privacy, but also (and even more) the privacy of affected third parties.

In a setup as described above, the \textit{roles of the involved parties} may be difficult to assign: The wearer of a device may in

\begin{itemize}
\item \textsuperscript{26} See above p. 5 et seq.
\item \textsuperscript{27} The most obvious example might be audio or video recording by means of wearable devices such as Google Glass.
\item \textsuperscript{28} See e.g. Art. 2 lit. h of Directive 95/46 EC of October 24, 1995, on the Protection of Individuals with Regard to the Processing of Personal Data and on the Free Movement of such Data ("EC Data Protection Directive").
\item \textsuperscript{29} This aspect will be further discussed below.
\end{itemize}
one situation act as data subject, in another as data controller; the developer of the wearable device or a related mobile app may once be considered a data controller, once a mere data processor. Uncertainty about everybody's function and role in relation to data protection issues may end up in inadvertent privacy breaches. The data controller in particular must always be fully aware of his role since specific obligations are imposed upon him.\textsuperscript{30}

Taking a closer look at the \textit{data} processed by wearable technology, the quantity and quality of such data need to be further assessed:

- Since wearable technology is constantly in operation, the \textit{amount of data collected and processed by wearable devices is extensive}. Just imagine the huge piles of data generated by devices monitoring biomedical parameters or continuously recording audio or video sequences.\textsuperscript{31}

- Most data collected by wearable systems will be considered \textit{personal data}, i.e. data relating to an identified or identifiable person. It has been pointed out earlier that wearable devices typically pertain to one single individ-

\textsuperscript{30} By way of example, most European data protection statutes provide for the data controller's duty to grant the data subject access to its personal data; see e.g. Art. 12 EC Data Protection Directive.

\textsuperscript{31} See further examples and scales in Intille / Intille (footnote 8), at 2/3.
Whatever data will be collected by such device may therefore easily be attributable to such individual. Audio and video recordings are also classified as personal data if the individuals in the recordings may be recognized (what is typically true in a wearable computing environment). Nearly any data processed by wearable computers will therefore constitute personal data and fall under the scope of application of most data protection statutes.

- Data collected by wearable systems will often not only be personal, but also *sensitive or qualify as personality profiles*. Apparently, most data generated by wearable health care and wellness devices will relate to health or the intimate sphere, two typical categories of sensitive personal data. Video recordings of individuals may reveal information on race or religious beliefs, other types of sensitive personal data. If personal data is complemented by context data (e.g. by geo-location services or activity trackers), personality profiles are likely to result. Sensitive personal data and personality profiles may, un-

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32 See above p. 5 et seq.
34 See e.g. Art. 3 para. 1 EC Data Protection Directive.
35 See e.g. Art. 3 lit. c of the Swiss Federal Act on Data Protection ("DPA").
36 It may, however, be debated whether such data constitutes sensitive personal data; see the discussion in Lipton (footnote 33), at 12.
der most European data protection laws, only be processed in observation of increased prerequisites and levels of protection.\textsuperscript{37}

Another complex issue relates to the \textit{purpose of data processing}. As a general rule in European privacy statutes, personal data may only be processed for the purposes either indicated at the time of collection, evident by the circumstances or provided for by law.\textsuperscript{38} Two setups have to be further distinguished:

- Looking first at the \textit{technology wearer's} personal data, this will include all acts of processing directly serving the use of the device to the benefit of its wearer; for example, in case of a fitness device, such use will include collecting data by the wearable device, transmitting the collected data to the wearer's portable device, using the transmitted data as input for the respective mobile fitness app on the wearer's portable device and storing such processed data for later recall by the wearer. But will the anticipated purpose also cover the transmission of such data to the developer of the wearable device and/or mobile app, or to third parties with no direct relationship to the wearer of such device at all? The secondary usage of

\textsuperscript{37} E.g. requirement of express consent to processing; see e.g. Art. 4 para. 5 DPA.

\textsuperscript{38} See e.g. Art. 4 para. 3 DPA.
personal data collected from wearable systems is highly appealing to industry: Such data may be used for countless purposes ranging from direct marketing to research.\(^{39}\) Many of these purposes may foster innovation and therefore appear legitimate. But are they also lawful?

- The problem is exacerbated with the processing of personal data collected from third parties, i.e. not from the wearer of the respective device: They will normally not be informed on the data processing purposes, nor will these purposes become evident to them from the circumstances - they might rather not even be aware that personal data is collected at all! Thus, the processing of third party personal data must only take place within a very limited scope of generally obvious and widely accepted purposes.

The concept of *data minimization* is derived from the general data protection principle of proportionality of data processing.\(^{40}\) Apparently, the processing and archiving of huge amounts of personal data collected by wearable systems runs counter to data minimization. In such a situation, the privacy interest of the data subject will have to be carefully weighed.

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\(^{39}\) To give an example, the website of Owlet, the smart sock for babies ([http://www.owletcare.com](http://www.owletcare.com)), describes as one of its device's main purposes to build the "largest infant data set for researchers".

\(^{40}\) See e.g. Art. 6 para. 1 lit. c EC Data Protection Directive.
against the data controller’s interest to process and store big data.

In most jurisdictions, privacy breaches may be *justified by overriding private or public interests*. Wearable technology, in particular devices designed for wellness and health care purposes may fall under such justifications. A good example is the use of Google Glass as an aid for visually handicapped people. Mobile apps dedicated to this specific field of use will soon be on the market. They will operate on real-time video recording of the user’s environment, applying context recognition software to the recorded images and giving the user specific directions and instructions (e.g. don’t cross the road, walk further left, mind the obstacle ahead). Third parties’ privacy rights will be strongly affected by such use of Google Glass which may not only take place in public areas, but also in private homes. In this scenario, the visually challenged user of Google Glass could invoke the justification of his private interest to alleviate his handicap. Such interest would most likely be considered as overriding.

As has been illustrated in this section so far, the use of wearable devices potentially conflicts with various fundamental principles of data protection. This raises the question whether the current legal frameworks for privacy needs to be adapted

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41 See e.g. Art. 7 lit. f EC Data Protection Directive.
to cope with the upcoming challenges raised by wearable technology. In my view, the answer to this question is no: The existing frameworks are essentially sufficient to address the legal issues faced in the area of wearable technology. In view of the fast development of new wearable devices and emerging fields of application unthought of today, every legislative attempt to keep up with wearable technology must, in my opinion, be destined to fail.\footnote{It appears that no legislative initiatives or projects specifically and expressly addressing wearable computing are in place. However, the European Commission’s Proposal COM(2012) 11 final of January 25, 2012, for a Regulation on the Protection of Individuals with Regard to the Processing of Personal Data and on the Free Movement of such Data ("EC General Data Protection Regulation") addresses some typical situations which may also occur in the context of wearable devices and introduces the concept of data protection impact assessments for such situations (see Art. 33). The issue is also on the agenda of regulatory or advisory bodies, e.g. on the Work Program 2014-2015 of the Article 29 Data Protection Working Party of December 3, 2013 (available at \url{http://ec.europa.eu/justice/data-protection/article-29/documentation/opinion-recommendation/files/2013/wp210_en.pdf}).}

This doesn’t mean that there is no need for action, though. In the remainder of this section, I will try to give some guidance on how to meet the privacy challenges of wearable technology:\footnote{Further thoughts on this subject may be found in Dvorak (footnote 4), at 337 et seq.}

- \textit{Privacy by design} is acknowledged as a key element of an effective data protection framework. For example, appropriate design of a wearable device will indicate to
the wearer and - more importantly - to third parties when the device is active (e.g. recording). Some developers of wearables have already committed to implement privacy by design principles in their devices.\footnote{See for example Google's response of June 27, 2013 (available at https://www.priv.gc.ca/media/nr-e/2013/let_130627_google_e.asp) to the letter from a number of Data Protection Commissioners of June 18, 2013 (available at http://www.priv.gc.ca/media/nr-e/2013/nr-e_130618_e.asp).}

- Another approach is to take privacy concerns into respect when \textit{designing mobile apps}. Most wearable systems are connected to mobile devices and communicate with corresponding apps on the mobile device. Regulation and guidance for mobile apps seem to have substantially further progressed than for wearable devices.\footnote{James Chang / James G. Gatto / Meighan E. O'Reardon, \textit{Mobile Privacy Practices - Recent California Developments Indicate what's to Come}, CRi 3/2013, at 71 et seq. See for example in the U.S. California's Joint Statement of Principles of February 22, 2012 (available at http://ag.ca.gov/cms_attachments/press/pdfs/n2630_signed_agreement.pdf); in Europe, the Article 29 Data Protection Working Party's Opinion 02/2013 of February 27, 2013 on Apps on Smart Devices (available at http://ec.europa.eu/justice/dataprotection/article-29/documentation/opinion-recommendation/files/2013/wp_202_en.pdf).} Adequate design of mobile apps may support the protection of personal data, e.g. by comprehensible user interfaces or appropriate default privacy settings based on opt in mechanisms.

- \textit{Soft law and self-regulatory principles} may also serve to address privacy issues. As with other technologies in the
past, widely accepted social rules and standards still need to evolve. They could entail a general ban of wearables from certain areas or environments (e.g. schools, with exceptions for challenged persons and devices worn in the body), the duty to turn off wearable devices at some places or times (similar to rules for mobile phones), the obligation to ask for express permission of third parties before activating a wearable (e.g. recording device), the duty to lock wearable systems against unauthorized third party access, or the principle not to use wearable devices at all times.

- Last but not least, self-responsibility of wearable technology users plays an important role in privacy matters: Users must be aware of privacy issues related to wearable devices and must understand how to address them adequately. Users wearing Google Glass with activated camera when drawing money from an ATM might not have built the necessary awareness of privacy concerns yet.

b) Product Liability and Safety

Some categories of wearable systems, in particular devices for health care or safety purposes, may cause considerable

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46 See e.g. the *Netiquette* ([http://en.wikipedia.org/wiki/Etiquette_in_technology](http://en.wikipedia.org/wiki/Etiquette_in_technology)) consisting of rules for the use of the internet.
harm and damages if not operating or operated properly. Imagine a wearable device measuring false blood glucose values, or calculating wrong reference values, and triggering the automatic injection of an insulin (over)dose into its wearer's blood circulation.

Such liability issues are not novel per se. However, the characteristics of wearable systems\textsuperscript{47} exacerbate some of the associated legal problems.

If a product is not working properly, the user would normally \textit{turn it off or take it off} when realizing the malfunction. This may cause difficulties with devices worn in the body. Designers and developers of wearable products must provide adequate safeguards to handle such situations, e.g. by implementing an emergency button or functionality.

The use of wearable devices goes in line with a \textit{loss of control} for the users of such devices. Due to the decision autonomy of wearable systems, human interaction and intervention is reduced or even eliminated. This may be a good or a bad thing: Bearing in mind that most damages are caused by human rather than by machine failure, it seems sensible to rely on technology rather than on its wearer. Still, some crucial decisions should not be taken autonomously by a wearable system, but be verified by humans in advance. Staying with

\textsuperscript{47} See above p. 5 et seq.
the above example of the wearable glucose meter, the injection of insulin should be triggered by a human interaction or confirmation upon a respective (automatic) alert by the wearable device. Designers and developers of wearable systems must ensure that devices are fault-tolerant and permit human intervention whenever appropriate or expressly requested.

Another property of wearable devices is their unrestrictive and non-monopolizing nature, permitting for simultaneous activities. While this feature contributes to the comfort and benefit of wearables, it also creates the danger of a lack of their wearers' attention. This may result in false user manipulations (of the wearable system itself or of any other activity performed simultaneously). For that reason, the use of wearable devices might not be appropriate in combination with certain activities; driving a car is a good example. To avoid liability, manufacturers and distributors of wearable systems must provide adequate guidance in that regard.

c) Regulatory Aspects

This section will shortly address whether and which wearable devices may be subject to specific regulatory frameworks.

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48 A first case has been reported of a woman ticketed for driving a car with her Google Glass on; she was eventually found not-guilty (see http://www.digitaltrends.com/mobile/woman-ticketed-wearing-google-glass-driving-wins-court/).
The focus will be on the European framework for wearable systems used for health care and wellness purposes.\textsuperscript{49}

Medical devices may be described as products, including instruments, apparatus, software and other goods or substances which are intended to have or are presented as having a medical use and whose principal effect is not obtained with a medicinal product. It is not necessary that the product has immediate contact with the human body for being considered a medical device.

The description covers all individually or compositely used instruments, apparatus, installations, materials or other medical-technical objects, including software and accessories, if their purpose is to

- recognize, prevent, survey, treat or alleviate diseases; or
- recognize, survey, treat, alleviate or compensate injuries or disabilities; or
- examine or change the anatomic structure, replace parts of the anatomic structure or examine, change or replace a physiological process.

\textsuperscript{49} In the European Union, the regulatory framework is mainly constituted by Directive 93/42/EEC of June 14, 1993, on Medical Devices and Directive 90/385/EEC of June 20, 1990, on Active Implantable Medical Devices.
Most wearable devices in the health care and wellness sector fall under this description and may therefore be considered medical devices.

As has been outlined earlier\textsuperscript{50}, wearable systems may have \textit{dual or multiple purposes}. Devices that may be used for health prevention, but have a primary non-medical use are not considered medical devices. For such devices however, it is prohibited to indicate in any way the preventing, alleviating or treating effect.\textsuperscript{51}

Unlike medicinal products, medical devices are \textit{not subject to an official market authorization procedure}. However, certain requirements relating to product safety, product information, product observation, risk classification, procedure of conformity, reporting obligations, prescription, importation, exportation and advertising still need to be observed and fulfilled. These requirements are assessed in a procedure based on personal responsibility of producers and distributors: Before being put into circulation, it must be proven in a conformity assessment that some fundamental requirements are fulfilled, i.e. that the product is not dangerous and has the expected effects. Depending on the type of device, the as-

\textsuperscript{50} See above p. 8 et seq.
\textsuperscript{51} Assuming the primary purpose of Glass was not its medical use and it did therefore not represent a medical device, Google would not be permitted to specifically market Glass as an aid for visually challenged people.
essment must be undertaken by an external state-accredited body or internally by the producer itself. After having successfully passed the assessment, the products can be labelled with the "CE"\textsuperscript{52} marking.\textsuperscript{53} Particular regulations may apply to active implantable medical devices, e.g. an artificial pancreas as described earlier.\textsuperscript{54}

The relevant European framework dates back from the 1990s and does not adequately reflect the technical and scientific progress over the past 20 years. A \textit{proposal for revision} of the European law on medical devices\textsuperscript{55} is expected to pass in 2014 and will probably come into effect soon after. The proposal intends to include implantable and invasive products without medical purpose to the medical device regulation if they have similar attributes and risk profiles (for example contact lenses). This could result in wearable devices outside the wellness and health care area falling under the regulatory scope for medical devices.

\textsuperscript{52} CE stands for "Conformité Européenne", i.e. compliance with EU legislation (see \url{http://en.wikipedia.org/wiki/CE_marking}).


\textsuperscript{54} See above p. 8.

3. Conclusions

This paper has outlined the characteristics of wearable technologies and their impact on the legal landscape. Due to their specific properties, wearable devices raise legal challenges in various areas, such as data protection, product liability or regulatory.

The author has analyzed and discussed some of the legal questions and tried to find adequate answers and solutions. He arrives at the conclusion that the awareness for legal issues in connection with wearable technology is still low and must be created, increased and shared among designers, developers, manufacturers, distributors and users (as well as non-users!) of wearables. The given legal framework appears essentially suitable and does not need major revisions. Instead, the existing legal toolbox should be implemented appropriately.

Roland Mathys
Basel, April 30, 2014