

The Impact of Automotive Standardization to Liability Risks Arising from Defective Software, Especially under European Law

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ABSTRACT

Defects in Software applications (e.g. driver assistance systems such as steering or braking assistance systems etc.) may have disastrous impacts on the relevant OEM as well as on their suppliers: Defective products may not only cause personal deaths or injuries, but also result in recall actions, producing high costs and causing material damage to the image of all companies involved. If the supplier of automotive software delivers standardized software in source code, the OEM is able to modify and/or extend the software. Then also the OEM may create bugs in the software. We will point out which contractual and organizational measures have to be implemented to deal with these risks. We will also deal with the question if and to what extent it is necessary and/or sufficient to meet the requirements of technical norms, e.g. IEC 61508 or Working Drafts (e.g. ISO/WD 26262 'Road vehicles - Functional safety').

INTRODUCTION

The use of software in safety relevant application areas (such as aircrafts, automobiles, industry, etc.) increases rapidly. Inevitably, the number of software defects in electronic controller units operating in these application areas increases as well, leading to malfunctions and failures of those electronic systems the defective controller units are part of.

Since we all know that the financial risks caused by a product liability incident and by the legal conflicts resulting therefrom are tremendous, it is clearly advisable to treat the subject matter of security designed software development with utmost care. The question of how to best possibly avoid product defects by means of a security designed and safety relevant development process must surely be of massive concern to the responsible personnel.

STANDARDIZATION AND ITS EFFECT TO CONTRACTUAL PROVISIONS WITH RESPECT TO LIABILITY

CONTRACTUAL LIABILITY

What exactly is contractual liability? Under European law, two areas of liability risks have to be distinguished in connection with defective software. One arises from the **contractual** obligation towards the contractual partner to deliver a non-defective product (contractual warranty and liability), and the other results from the **statutory** obligation to prevent the customer from damages to his property and from personal damages by distributing safe and secure products (so called "*product liability*" and "*producer's liability*"). Contractual liability is the liability which is applicable only towards your direct contractual partner. If a product is defective in terms of law, the customer may according to European Directive 1999/44/EG claim the remedy of the defects or the substitution of the defective product by a non-defective product, both during the warranty period of two (2) years. This warranty period of two (2) years is mandatory with respect to contracts with consumers, but may be shortened in contracts with non-consumers. Customers may exercise the before mentioned rights regardless of whether the defect was caused by the distributor's fault or not. However, if the defect was caused by the distributor's fault, the customers may additionally claim compensation for damages caused by the defect, such as damages to objects other than the defective product, loss of profit, loss of turnover, etc.

The supplier is basically only liable to its customers and/or to any third party, in case the relevant product delivered by the supplier contains a "*defect*" in terms of law. Therefore, the term "*defect*" is the central term within the framework of warranties and/or liabilities. In order to decide which measures must be taken to ensure that (i) the development process of software and/or (ii) the software products resulting from this process do not contain a "*defect*" in terms of law, we



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shall first take a closer look on the legal definition of “defect”.

In the EU the European Consumer Sales Directive 1999/44/EC states in its Article 2 whether a product is defective or not. In Germany and in most other member states of the EU, the tight rules of the Consumer Sales Directive on defects have not only been implemented with respect to contracts with consumers, they have in fact also been implemented with regard to all other kinds of contracts. As the concept of “defect” according to the Directive 1999/44/EC has – as a result of this development – become the de facto standard in the EU, the following considerations are based on the rules of the Directive 1999/44/EC.

Features Agreed on in the Contract as Defect

Where the parties have agreed on certain specifications of the software, the software is defective in terms of law:

- If the software does not comply with the specifications agreed on between the parties,
- As far as no such features are agreed on in the contract:
 - If the software does not contain those features necessary for the use of the software which is intended by the parties’ agreements relating to the software, or
 - If the software does not contain those features which the customer may reasonably expect from software of the same category as the software in question.

Obviously, the customer will expect the software to have those features which are expressly agreed on in the relevant contract. At first sight, this sounds trivial, but these expectations are often the basis for legal conflicts, since often it is unclear what exactly the parties meant by certain wording and/or language in the contract in connection with the description of the software’s specifications. If such questions are in dispute, the competent court has to decide on the conflict in accordance with the common legal interpretation rules. This interpretation will, under most legal systems in the EU, take into account the principles of good faith from an objective point of view, considering specific practices of the involved parties’ professional activities.

Example: If it is agreed that “*the software shall have appropriate response time*”, these response time is different with respect to call center software as they are with respect to software for the automotive industry.

Features not Expressly Agreed on in the Contract as a Defect

To the extent the parties have not expressly agreed on specific features in the contract, the software must – as

shown above – contain those standard specifications, which can reasonably be expected by an average market participant.

It depends on the usual and conceivable use of the software what exactly a market participant is allowed to expect. This means that the market participant may not only expect the features the producer has recognisably intended, but also those functions which may be expected from a reasonable client’s point of view.

To comply particularly with the requirements with respect to safety issues:

- The software has to be designed and manufactured in accordance with the current standard of science and technique (= state-of-the-art techniques), as well as in accordance with the typical use of the software usually applied by the relevant occupational groups.¹
- This standard is also defined by technical norms, so they are at least minimum requirements. We will deal below with the question if compliance with standards results in an exemption from liability with respect to the producer and/or supplier. But what happens if only a working draft does exist? E.g.: An adoption of the IEC 61508 is made for the automotive branch. For this norm (ISO/WD 26262 ‘Road vehicles - Functional safety’) only a Working Draft (WD) does exist. Has this WD to be considered? A similar case was decided by the German federal court, however with reference to European law, so that other courts in the EU probably would have come to the same findings: A machine was manufactured in 1994 according to the norms in force but not according to a draft of a European Norm (EN) of 1994 which was published in 1999 and became effective in 2001. The court held that the machine was not defective in 1994 because the draft only had started a discussion about the relevant safety requirements and so it was not likely that the requirements of the norm were known by the relevant public. However, if the discussion would have been in a phase where the relevant public should have heard of it (e.g. because it is published and discussed in several journals), the court might have come to another finding. This will depend on several circumstances, e. g. if the new requirements are solving known problems of the old standard. Please note that a product may also be defective if there is no discussion about it, e. g. if a problem can be seen by a skilled person also without such a discussion.
- Furthermore, the software has to be as safe and secure as the customers (i.e. the public) may reasonably expect with respect to the software’s common application areas.²
- In addition, the customer’s expectations are legitimately influenced by the price range of the product. For example, a luxury car can be expected to have more safety-designed features than a lower

middle class car. Or, another example, in the year 2000 the customer could, from a legal point of view, not have reasonably expected that a middle class car is equipped with an ABS-system.³

LIMITATION OF CONTRACTUAL LIABILITY

How much can and should contractual liability be restricted? It is very advisable to limit liability.

It is a scientific fact that software cannot be produced without faults – at least not to a reasonable price that anyone would (or could) pay – unless the software is completely trivial. This is because software – unlike other goods like e.g. gear-wheels – cannot be fully tested in a reasonable period of time due to the number of possible combinations of the program code.

For example, it is known that software of the best software suppliers like IBM, Hewlett-Packard or the Software Engineering Laboratory (SEL) of NASA contain one (1) to three (3) errors within 1000 lines of program code (KLOCS). In a quality improvement (!) program of the federal states of the Federal Republic of Germany, an error-rate of five (5) errors per KLOC was agreed on as acceptable.

Therefore, it is highly probable that software might contain some errors. Even if they are often tested standard modules it is unforeseeable how the software (or the generated object code) will interact when used with other software or applications used or modified by the OEM, what will become more likely in the future because of the standardization processes in the automotive branch.

In Individual Contracts (Framework Agreements)

In individual contracts or framework agreements, according to German law and similar according to other European jurisdictions, only the limitation of liability for wilful misconduct is not allowed. However, the software house should consider that it may be – from a business approach – not being too wise to exclude liability for gross negligence. Gross negligence means not to pay attention to things which should be clear to anyone. If the software house does exclude liability for gross negligence, it tells its costumers in other words that it might not pay attention to what should be clear to anyone and does not even want to be liable in this case.

In General Terms and Conditions

In General Terms and Conditions limiting liability is possible only to a small extend. According to German law and similar according to other European jurisdictions, it is not possible to exclude liability for wilful misconduct and for gross negligence. Regarding normal negligence it is not possible to exclude liability for essential contractual obligations and this has to be phrased expressly. It is highly advisable to be very

careful when phrasing such a limitation of liability: If the legal requirements are not matched, the *whole* limitation of liability will be void and therefore the liability will be unlimited!

STANDARDIZATION AND ITS EFFECT TO STATUTORY LIABILITY

PRODUCT LIABILITY AND PRODUCER'S LIABILITY IN GENERAL

Both legal concepts of statutory liability – product liability as well as producer's liability – are based on the idea that a producer and, under certain conditions, also the distributor of a product shall advert damages from the property and the persons of the product's users by making the product as safe as technically possible. The legal concept of "*producer's liability*" has been developed by European courts as case law based on the principles of tortuous liability. This development has already taken place before the European Product Liability Directive (85/374/EEC) and its national implementations (e.g. in Germany by the Product Liability Act (PHG)⁴) have entered into effect. This directive contains the European statutory framework for the legal concept of "*product liability*". Product liability and producer's liability coexist independently. The major difference between both legal concepts is that product liability applies regardless whether the product user's damages were caused by the producer's fault or not, whereas producers' liability always requires a negligent behaviour of the relevant producer.

"*Producer*" in terms of product liability is not only the manufacturer of the relevant product, but also any entity having brought the relevant product into the EU.

Product Liability

Product liability applies in cases in which a defect of a product leads to damages of products (other than the originally defective product) and/or to injuries of persons, regardless whether the producer is at fault or not. The only exception thereof is set forth in Art. 7 lit. e of the European Directive 85/374 EEC: Product liability is not applicable if the defect of the product could not have been prevented even by using state-of-the-art technologies at the time the producer has put the product into circulation. As almost all defects of products are technically preventable, product liability will apply in almost all cases in which a product contains a defect. Therefore, from a legal point of view, product liability may only be prevented with respect to the end product by avoiding defects in the course of the design and/or development process.

This is one reason why a specific safety designed development process has to be implemented into the organizational structure of any entity dealing with the design and development of products, in particular