# IoT in gastronomy and beyond: Rastal & Connect One

# Rastal/ Connect One

Connect One Digital AG is a company specializing in the provision of communication and connectivity solutions. It offers a wide range of services, including network solutions, connectivity, infrastructure management and corporate communications.

With regard to the company Rastal, which will also be presented later on, Connect One holds a strategic position. Connect One works closely with Rastal to provide innovative technology solutions that improve the connection between Rastal's products and customers' needs.

Rastal is a German company specializing in the production of high-quality glassware, especially drinking glasses, and barware for the hospitality industry. The company has approximately 350 employees, was founded in 1919 and is headquartered in Höhr-Grenzhausen, Germany.

Rastal shapes the national and international table and drinking culture with its innovative designs. The company offers a wide range of glass products, including beer glasses, wine glasses, cocktail glasses and shot glasses. The company also manufactures ceramic cups and mugs such as the famous Oktoberfest stein.

To complement its assortment of products, Rastal also offers its customers custom glass moulds that allow them to create unique glasses that reflect their brand (or brands) and style. This is a concept that RASTAL pioneered back in 1964 with the idea of Brand Signature Glass - the concept of an individual glass design that is exclusive to one brand. The glasses then have a unique shape, possibly including a unique logo, and are thus so-called "brand exclusive glasses". These special glasses are optimized for specific types of beverages such as beer, wine and cocktails. This ensures that the beverage is presented in the best possible way and that its taste and aroma are shown to their best advantage. This then also showcases the brand message and recognition value.

Rastal products are sold in more than 90 countries worldwide, and the company has a strong presence in the hospitality industry through its products, including hotels, bars, restaurants and catering services. The "brand exclusive glasses" allow Rastal to have a direct impact on the customer, who often decides what drink to drink based on the glass shape and logo alone. Should it be a Kölsch from a slim, tall glass (Kölsch, for example, may only be served in Kölsch glasses - keyword Kölsch convention) or rather the Jever from its typical shaped glass. Through the "brand-

exclusive glasses", for example, Rastal enables breweries to have a direct effect on the end customer, i.e. the consumer of the beer. The effect of the beer brand's advertising thus occurs not only through general television or magazine advertising, but also when the beer is consumed from Rastal's "brand exclusive glass", which was designed exclusively for the brewery. The glass is also often part of the advertising - such as in the current Warsteiner brewery commercial.

Consequently, at Rastal, the motto is "*design with added value: an individual glass design as an exclusive combination of brand identity and promise of enjoyment - tailored to the brand, target group, budget and specific purpose*." Design protection is also primarily reflected in the IP portfolio.

But Rastal does not only offer the assortment glasses and the brand exclusive glasses. There are also particularly smart glasses, for example, with an NFC chip. The Rastal smart glass is able to act with the Internet, the so-called Internet of Things (IoT). This enables direct interaction between the consumer, the restaurant and the beverage brand - in real time. As a result, three different degrees of freedom - the glass, the consumer and the industry - can be used to enable diverse and individualized customer journeys and bring the respective brand to life for the consumer. The drinking glass becomes the optimal customer touch point. Rastal's journey started with standard drinking glasses, led via brand exclusive glasses now to Rastal Smart glasses. This is made possible by the targeted establishment of the legally independent Connect One Digital AG, whose focus is on the cloud and the connection of the inherently analog glasses with digital benefits and services. This cooperation and connection of the respective core competencies enables Rastal to permanently develop its portfolio of "*smart glasses*". Connect One Digital AG networks products far beyond the drinking glass, in B2B and B2C applications, creating reference cases that can be transferred equally positively to the beverage industry.

Rastal Smart glass is consequently today a series of innovative glasses that have a (growing) variety of technological functions that improve the drinking experience for customers and provide valuable data for bar and restaurant owners. Until now, the principle for customers in a bar or restaurant has always been "*I want to drink a glass of wine, so the wine is drunk from a wine glass.*" The new drinking experience with smart glasses goes beyond the actual drinking and also beyond the effect of the "*brand exclusive glasses.*" It begins, for example, with the linking of the restaurant owner and guest using the smart glasses and the guest's smartphone. The guest can use the smart glass to take part in competitions, for example, or to view potential discounts or place orders with the bartender.


The smart glasses are equipped with a small NFC chip for this purpose, which is aesthetically integrated into the brand image and can be connected to a smartphone or other NFC-enabled device. The advantage here is that the chip cannot be rubbed off or washed off. The NFC chip provides information about the glass, such as its origin and the type of beverage it is intended for. This information can be used by bartenders to identify the glass and serve the appropriate beverage quickly and easily.

In addition, the NFC chip can also be used to track the glass throughout its lifecycle, from manufacturing to final recycling. In this way, bar and restaurant owners can collect valuable data about their glasses, such as how often they are used, what the average drink consumption is, or which drink types are most popular.

Overall, the smart glasses offer a unique combination of technology and design thanks to the cooperation between Rastal and Connect One Digital AG and Cloud. The analog glass becomes a digital interaction channel. For the first time, it provides valuable data for bar and restaurant owners while improving the drinking experience and the customer journey for the end customers/guests.

Connect One consequently supports Rastal in implementing modern communication and connectivity technologies in their products.

In addition, Connect One can support Rastal in setting up network solutions that enable efficient communication and data transfer between different locations or partners. This is particularly important for companies that operate globally and want to ensure a smooth flow of information.

The partnership between Connect One and Rastal aims to provide innovative solutions that help Rastal remain competitive and meet the needs of its customers. By integrating modern communication technologies into their products, Rastal can add value to their customers and help them optimize their business processes. Connect One brings its expertise in communications and connectivity to help Rastal drive digital transformation in the beverage industry.

### Tradition meets modernity

*Through the partnership between traditional companies and modern technology companies, new business areas and business models can be developed, which can generate new added value.*

*Connect One Digital AG*
*Headquarter: Frankfurt/Main*
*Co-Founder+Management Board: Carsten Kehrein*
*Industry: Cloud-Service/ Connected Solutions*
*Website: https://connect-one.digital/*

*Rastal GmbH & Co.KG*
*Foundation: 1919*
*Headquarters: Höhr-Grenzhausen*
*Management: Raymond Sahm, Thomas Nieraad*
*Number of employees: around 330*
*Turnover: € 36.47 million*
*Industry: Glassware*

# Digital Transformation and IP

IP and digital transformation are closely linked, as the introduction of digital technologies is changing the way intellectual property is created, managed and exploited. Digital transformation refers to the process of using digital technologies to fundamentally change business models, processes and operations and has a significant impact on the way IP is created and managed.

One of the keyways digital transformation is impacting intellectual property is through the creation of new forms of digital intellectual property, such as software, digital content, and connecting products to the Internet (IoT). Digital technologies are also enabling the development of new tools and platforms for managing intellectual property, such as digital rights management (DRM) systems, linking digital tools to physical products, or forming online marketplaces for both products and intellectual property.

Digital transformation is also impacting the way companies can protect and enforce their intellectual property rights. For example, the use of Big Data and artificial intelligence (AI) can help companies more effectively monitor and detect IPR violations, while blockchain and other distributed ledger technologies can be used to create secure and transparent records of property rights and transactions.

At the same time, digital transformation is also creating new challenges for IP management, such as the ease of copying and distributing digital content and the rapid pace of technological change. Companies need to be agile and proactive in adapting their IP management strategies to keep pace with these changes, and potentially adopt new approaches to IP management, such as open innovation and collaborative IP development.

Overall, digital transformation is having a profound impact on the way IP is created, managed and exploited, and companies must be prepared to adapt to these changes in order to effectively protect and leverage their IP.

For this reason, effective, high-quality IP management is necessary.

# IP-Management

IP management in this context refers to the process of identifying, protecting and using a company's intellectual property. Intellectual property can include patents, utility models, trademarks, know-how, trade secrets and other forms of intangible property created by a company's employees or acquired through partnerships, collaborations or mergers and acquisitions.

Effective IP management involves several important steps, including identifying and evaluating the company's intellectual property, developing a strategy to protect and enforce that property, and using the intellectual property to create value for the company through licensing, partnerships, or other means.

An important aspect of IP management is securing legal protection for the company's intellectual property, which may include filing patents, utility models and trademarks with the appropriate authorities. This can prevent others from using or profiting from the company's intellectual property without permission.

Another aspect of IP management is the enforcement of the company's intellectual property rights, which can include legal action against infringers as well as proactive measures such as monitoring the market for potential infringements and taking steps to prevent infringements before they occur.

Overall, effective, high-quality IP management is critical for companies that rely on their intellectual property to compete in the marketplace. It can help protect those assets, create value for the business, and drive innovation and growth.

# DIN77006/ ISO56005

Support for the implementation of high-quality IP management is provided by DIN77006 and ISO56005.

DIN 77006 is a German standard entitled "Intellectual Property (IP) Management Systems - Requirements". This standard is about intellectual property (IP) and the establishment of qualitative IP management. The standard provides recommendations for guidelines on how to ensure quality within an IP management system. It is a version of ISO 9000/ ISO 9000 adapted to IP management and is also partly derived from ISO56005, innovation management.

DIN77006 emphasizes above all the importance of interdisciplinarity and collaboration. It encourages the involvement of experts from different disciplines and collaboration with external partners to achieve the best results.

Another standard on the protection and management of intellectual property in innovations is the aforementioned ISO 56005, Innovation management - Tools and methods for managing intellectual property. It provides guidelines and strategies that organizations can use to protect, manage and maximize their commercially important innovations. However, its focus is particularly on the management of innovations and the innovation process.

Managing one's IP portfolio at every step of the innovation process makes good business sense and helps create a true incubator where creativity can grow. ISO56005 includes a general IP management framework, risk management tools and methods for IP use, and other aspects. Consequently, DIN77006 and ISO56005 provide a good foundation for optimizing innovation management and improving quality in IP management.

This is critical as it enables companies to protect and exploit their innovations and gain a competitive advantage in the marketplace.

DIN77006 provides guidance on a wide range of IP-related topics:

- IP strategy,
- IP generation,
- IP administration,
- IP risk management,
- IP defence,
- IP enforcement,
- IP transactions,
- IP reporting,
- IP awareness.

Among other things, the standard deals with the identification of intellectual property and inventory management, the development and implementation of strategies for the protection of intellectual property, the commercialization and possibly licensing of IP, IP risk management and, in particular, the raising of awareness of intellectual property and training of employees, of the various departments of a company.

According to the standard, the IP strategy is about determining the IP needs derived from the targeted IP position to achieve the business objectives. It should also derive the necessary measures for using IP to develop the market position actively and continuously. Furthermore, the IP strategy should serve to outline the necessary financial and human resources as well as the organizational framework for its implementation.

In the patent system, it is more common to react reactively to incoming invention disclosures than to actively promote new ideas within the company. Therefore, the IP generation section is also important for companies. According to experience, incoming invention disclosures, for example, are only checked to see whether an idea is filed or not, whether it fits a product or target, but rarely are new ideas actively searched for in the company in order to still supplement the IP portfolio or to find new exclusivity opportunities.

In this context, it is relevant to use IP generation to ensure the systematic and goal-compliant design of IP or the further development of an IP portfolio to meet IP needs along the defined IP strategy as well as the systematic identification of valuable IP and the stimulation of creative performance to create IP.

IP administration is the actual organizational part. It is about the knowledge and the overview of the own IP inventory. Furthermore, IP administration is about the economic efficiency of this IP inventory for the IP strategy. In this context, compliance with the applicable standards and laws is also part of this area.

IP risk management is understood to mean the recognition of risks and dangers for the company's own IP inventory and through the IP inventory of the competition. This also involves defining measures to control these risks in order to maintain the company's own freedom of action and to avoid damage to the company.

IP enforcement is about systematically identifying potential infringements of one's own legal position by third parties and dealing appropriately with identified infringements by taking suitable countermeasures.

IP defence involves responding in a planned manner to IP-based attacks by third parties and dealing with corresponding disputes in a legally compliant manner.

IP transactions involve the purchase and exploitation of IP rights and the possibility of incorporating licenses as another option for an economic relationship.

IP reporting establishes the transparency of IP investment controlling, shows the target-oriented allocation of resources, serves to control the investment areas and enables the target-oriented design and optimization of the IP portfolio.

The objective of IP awareness is to create an appropriate understanding of the economic impact of IP in the business model among all stakeholders of IP management in the company.

Thus, DIN77006 and also ISO56005 not only influence the work of the IP department but have an impact on both innovation management and the entire company for the implementation of high-quality IP management.

In this regard, the standard is flexible and adapts to the specific needs and resources of different companies and can be used as a tool for self-assessment and continuous improvement. By implementing the guidelines outlined in the standards, companies can develop an effective IP management system that helps them protect and leverage IP portfolios and gain a competitive advantage in the marketplace.

## Special features at Rastal/ Connect One

This chapter will describe the implementation of one of the chapters of DIN77006 at Rastal, in particular also at the targeted separately founded company Connect One. In this context, the interview with Thomas Nieraad (CEO Rastal/ chairman of the supervisory board Connect One) and Carsten Kehrein (Head of Design RASTAL / Board of Directors Connect One) revealed that Rastal focuses in particular on the protection of its glasses by designs in terms of IP. To this day, Rastal is considered the inventor of branded exclusive glass and the innovation leader in its industry, and regularly secures this status through new design protection rights.

Connect One, on the other hand, tends to focus on protection through patents in combination with strategic technology partnerships. This is also due to the fact that Rastal's focus of action is on physical products, while Connect One implements its digital know-how in physical products. The company uses the Smart print process to print NFC chips on glasses, which can be loaded with digital content at any time using the Connect One Cloud, thus enabling the decoupling of hardware and software development. In the process, the NFC chips are glued onto the glasses and overprinted. This makes them non-copyable, non-removable and forgery-proof.

At the same time, Connect One provides a high level of data protection through the cloud feeder, which transforms the data and decrypts it only at the authorized location. Another advantage of this technology is that it can be connected without the need for any additional tools other than a smartphone. This is a low-threshold entry point for the customer.

Connect One acts like an Internet provider for objects and enables multidimensional networking of things. Through the NFC chips, the object, in Rastal's case the glass, knows how it was handled, how it was filled, for example, or to which table it was taken - or the NFC chip knows where the glass was delivered, when it was produced, what type of glass and what size of glass.

These NFC chips on the glasses, in turn, also enable restaurateurs to create new business models, such as ordering the next drink via app or increasing customer loyalty through, for example, competitions or product information. In addition, the glasses are better protected against theft and easier to find for the service provider, e.g., the smart glasses support him in taking inventory.

One conceivable option, for example, would be plates with NFC and QR code. In this way, the plate "knows" what it is filled with and the guest can use the QR code to find out, for example, the ingredients, nutritional values and possible allergens, or even rate his food directly. It would also be possible to combine this with an "intelligent" dishwasher that recognizes before the rinse cycle how many plates, glasses, etc. - and what products (the chip reveals this) are in it and adjusts the amount of water and detergent as well as the time-temperature curve accordingly, because crystal glass with gold is then rinsed differently and more efficiently than a clay jug. Another possibility is the combination of a glass with NFC technology with an "intelligent" tap, which then recognizes how often this glass has already been filled with a certain beverage - and only releases when the correct glass of the brand is also at the right tap, e.g. Bitburger beer belongs in Bitburger brand glasses - only then is released.

Connect One has also protected these ideas in its patent "Method for providing object-related communication". The special feature of their solution is the independent recording of services on the NFC chip, in which the user can decide for himself whether or not to call up a service. If he retrieves a service, this is done anonymously via the object.


Consequently, the path of Connect One once started in the origin with Rastal's glasses. The technological development of the company then required a separate and independent establishment, as completely different core competencies had to be developed. This now makes it possible to move from IoT islands to the networking of objects, because the Connect One solution gives each object its own identity, which can be fed with targeted information and digital services as needed. This is where the circle closes again with Rastal, which can now offer glasses and other drinking vessels in the beverage industry with completely new added value, a very distinctive USP, and the corresponding competitive differentiation.

From glass via IoT into the world of networked objects!

## Rastal, Connect One and the handling of the DIN77006

Both Thomas Nieraad and Carsten Kehrein see the fact that they have not yet fully dealt with the topic of "high-quality IP management in accordance with DIN77006" for their companies. However, in the course of the interview conducted, it becomes clear that they have already dealt with this despite the only resources available. Due to their intensive innovation activities, it also appears that the two companies have already dealt with the topic more than their comparable competitors.

For example, in the area of IP strategy and the identification of IP needs, both companies have decided in particular to protect their unique selling propositions. For example, Rastal's glasses are protected by corresponding designs and in some cases by trademarks. This also applies to Connect One, which has secured its know-how in a patent. In this way, both companies can operationalize the benefits of the property rights for the customer, ensure a quality differentiation from competitors and, in particular, offer a very high level of counterfeit protection. In addition, both companies rely on trend scouting, regular exchange with network partners from industry and services, universities/research institutes and competitor monitoring in order to identify relevant future trends at an early stage and to be able to react accordingly.

In the context of IP generation, Rastal relies on the approach "*A concise new design is registered*". This is an IP strategy that has existed in the company for many years. However, there are rarely any "*free*" ideas, as the company usually works on behalf of customers. Increasingly, AI support is also being relied upon in the area of design development. In the case of Connect One, the future will show which path the company will take in the area of IP generation.

IP administration in both companies is handled by an external patent attorney. The latter also provides support in IP risk management in terms of searches and trademark monitoring, as well as in IP transactions. Both companies also rely on the support of the external patent attorney and, if necessary, a lawyer to enforce and defend their IP rights. They also rely on visits to trade fairs, review of technical literature and regular exchanges with customers and suppliers in order to stay up to date.

In terms of IP reporting, both companies currently only carry out IP cost controlling as part of budget planning. Otherwise, there is no further internal reporting. Externally, however, care is taken to ensure that both companies communicate their positioning as innovative companies in a sustainable manner.

At Rastal, IP awareness is raised in particular through personal exchange. This also applies to Connect One, although Carsten Kehrein also pointed out that with the currently still minimized number of employees, this is currently the most efficient and productive option, but not yet the ideal one in the long term.

Thus, the IP behaviour of Rastal as well as Connect One is beneficial for the corporate strategy, because they use their IP for differentiation and transport to the outside through marketing. Both Thomas Nieraad and Carsten Kehrein emphasized that IP has to fit the company's purpose, otherwise it is problematic.

Since Rastal has become more digital, Rastal has a stronger focus on IP, Thomas Nieraad said. For Connect One, IP is the starting point for the company, because otherwise there would be no company, said Carsten Kehrein.

In both companies, IP rights were increasingly filed for digital solutions and corresponding trademarks. These were always deliberately filed like a "bouquet of flowers" so that the chances of obtaining grants and registrations are higher and these can then also be used for defence, disputes and diversionary tactics.

In summary, it can be said that both companies still have potential in the expansion of IP management analogous to DIN77006, but through their compact structures, especially in the area of IP awareness and IP strategy, are already very well aware of what the optimization points are and have implemented in particular the linking of digitization and IP very successfully in the company.

A special thank you therefore goes to Thomas Nieraad (CEO Rastal / chairman of the supervisory board Connect One) and Carsten Kehrein (Head of Design Rastal / Board of Directors Connect One) for their participation in this case study within the I3PM Industry Case Study Program.

# Authors

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He studied business administration at Saarland University, majoring in marketing and business informatics, graduate in business administration. 35 years of professional experience in the global future orientation of business units, companies and development of innovative new business approaches/ models with great fun in exploring "new shores".

**Carsten Kehrein**
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Carsten Kehrein began his training in 1990 at the Glass College in Rheinbach. In 1994 he joined the design studio of Rastal GmbH & Co. KG. Since 2001, as head designer, he has been developing exclusive glasses for national and international brands - setting trends and leaving his mark on the beverage world. He has received numerous awards for his creations.

**Nora Rüter**

Nora is a patent engineer with a dual degree in engineering, a MBA business law (AIM/FH Burgenland 2021) and a LL.M/MIPLM (CEIPI 2022). She started her career as patent engineer at Harting, is since 2018 patent engineer at the Grimme and started her own part-time IP engineering office Rüter in 2023.