Dr. rer. medic. Thomas Petzold
Katharina Ille MA
Pauline Effenberger MSc
Dr. rer. pol. Kerstin Rego
Dipl.-Biol. Heike Beschmann
Jörg Siebert
Dipl. Betr. Oliver Steidle MA

Promoting digital transformation in the healthcare sector

Analysing the skills profile from the perspective of quality and risk management

Summary

Background: Healthcare is confronted with various challenges. The digital transformation represents both a challenge and an opportunity. Different expectations are associated with the digital transformation, which can only be achieved through high financial and personnel expenditure. Existing staff must be qualified in order to utilise the potential of digital transformation and fulfil expectations. However, it is unclear what qualifications staff need. The aim of this article is to analyse the skills profile from the perspective of quality and risk management and to identify further skills to promote digital transformation.

Method: A semi-structured literature search was carried out in scientific and user-related databases and specialist journals. In addition, books and websites were included in the analysis in order to provide a broad publication base for the research. The competences were selected by one person and the identified competence and its assignment to the generic competence cluster was agreed with the participation of all authors.

Results: A total of 89 competences for quality and risk management were identified and assigned to the three generic competence clusters of personal competences, technical and methodological competences and competences for promoting digital transformation. For the digital transformation competence cluster, 20 competences were identified, which cover topics such as digital literacy, possible uses of data analytics and artificial intelligence, the ability to make judgements about digital innovations, and will develop further facets with increased use in healthcare.

Discussion: The competences identified expand the competence profile of quality and risk management officers and reflect their central role in the management and support of healthcare facilities. The scope and level of detail of all competencies listed may vary by organisation, most commonly associated with their size and culture. In order to achieve the goals of digital transformation, personnel must be sufficiently qualified. Building on this, this skills profile offers the opportunity to address employees in a needs-based and targeted manner with training and further education programmes. The extent to which quality and risk management officers qualify themselves with regard to the competences identified should be coordinated depending on existing professional groups with detailed specialist knowledge and a culture of exchange between all professional groups should be promoted.

Key words

Digital transformation; quality of care; competences; quality management; risk management

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Healthcare faces a number of major challenges for which attempts are being made to find beneficial solutions with the help of various legislative initiatives and the efforts of all stakeholders in the healthcare system [1-3]. These challenges have different causes. Personnel and financial challenges and their significant and drastic effects on the care situation are currently the most frequently discussed. There are also other tasks. Another challenge, which also represents an opportunity, is the digital transformation of healthcare [4, 5]. There are a number of justified expectations associated with digital transformation measures. For example, care structures should be tailored to needs [6], care processes should be sustainable [7], care data should be stored securely, without redundancies and analysable [8], care outcomes should be aligned with the needs and goals of the insured person and the benefits for society should be demonstrable [9]. Legislators have drafted a series of laws to define these expectations and support healthcare organisations in achieving these goals [10-12]. The sustainable implementation of digital innovations requires organisations and individuals to implement the requirements of digital transformation in a structured and sustainable manner. Organisations are called upon to view their structures and processes as disruptive, to critically evaluate them and, if necessary with the help of digital innovations, to align them to the benefit of the patient. Digital transformation measures can be implemented within individual structures and processes, at interfaces between actors acting in partnership within and outside an organisation or between insured persons and healthcare facilities [13].

>> In each of these scenarios, different professional groups are required to establish digital innovations in the care process. These professional groups include therapeutic staff involved in direct care, such as doctors, nurses and healthcare professionals, together with staff who are not directly involved in the provision of care. This second group includes, for example, employees from IT, logistics, purchasing, medical controlling and patient management as well as quality and risk management. Due to this large number of different professional groups, centralised management is required for the implementation of digital innovations [14]. An organisation's quality and risk management already coordinates between all professional groups and acts on behalf of the organisation's top management [15]. It is therefore predestined to be the link between all structural units of an organisation for the digital transformation.

Qualified personnel are required for the conception, development, implementation and evaluation of all innovations. Staff should be able to recognise the potential of (digital) innovations and be able to implement and evaluate them. It is unclear which competences healthcare facility staff should have in order to sustainably promote digital transformation in the healthcare sector.

The aim of this article is to analyse the competence profile for quality and risk management officers in healthcare facilities, to critically examine established competences and to identify relevant competences to promote digital transformation in order to adequately meet the demands placed on this professional group

and to promote digital transformation in the healthcare sector through their contribution.

Method

A semi-structured literature research was conducted on existing requirements for the competence profile of quality and risk management officers based on the 'Digitalisation and Quality Management' working group of the Gesellschaft für Qualitätsmanagement in der Gesundheitsversorgung e. V. (GQMG). The GQMG is an interdisciplinary and multi-professional medical association that operates throughout Germany and deals with the content of activities and areas of work in the field of quality and risk management.

The literature search was designed and carried out by the authors in the Digitalisation and Quality Management working group. They opted for a semi-structured approach that goes beyond a narrative review. Search criteria, databases to be included and keywords were defined in advance by the working group participants.

The conceptualisation was preceded by a development process within the working group to determine which generic activity content and areas of work

- currently carried out by quality and risk management officers in healthcare facilities and
- the working group believes that quality and risk management officers will be responsible for and work on in the future.

Based on these results, generic competence clusters were formed that reflect the activities and areas of work of quality and risk management officers. The generic competence clusters comprised

- Personal competences (personal, social-communicative, activity and action competences),
- technical and methodological competences and
- competences for promoting digital transformation.

As part of the research, an attempt was initially made to assign each of the identified competences to one of the three generic competence clusters. If competences were identified that could not be assigned to a generic competence cluster, the working group was consulted and an assignment was jointly agreed.

The search criteria used were the name of the three competence clusters, quality management officer/risk management officer or QMB/RMB and the competence or requirement. Scientific and user-related journals, books and websites were defined as databases. The PubMed, EBSCO and CINHAL databases were used to search the scientific journals. The websites included (medical) professional societies of other professional groups. German- and English-language publications were included. During the research, identified publications were screened by one person and the competences and requirements for a person to promote digital transformation from a quality and risk management perspective were extracted. The results were collected in the generic competence clusters, presented to the working group and a consensus was reached between each competence and a generic competence cluster.

Results

The research identified 89 competences, which were grouped into the three generic competence clusters. As competences were listed in several publications, the citation is based on the name of the generic competence cluster for reasons of traceability. As not all competences are self-explanatory, selected competences were described in more detail and their text origin was noted directly.

Personal competences [16-24]

31 personal competences were identified: Personal initiative, empathy, decision-making ability, flexibility, friendliness, growth mindset, interest in other individuals and organisations, intercultural competence, communication skills, cooperation skills, creativity, customer sensitivity, ability and willingness to learn, problem-solving skills, media skills, networking skills, openness, (self-)organisational skills, problem-solving skills, ability to reflect, resilience, willingness to take risks, independent work, social behaviour, team building, leadership, motivation, ability to work in a team, dealing with failure, entrepreneurial action and willingness to change as well as taking responsibility.

The following personal competences should be addressed separately: Growth mindset [16, 17] involves continuously striving and learning to improve one's own actions. This improvement mindset can have a positive effect on the direct individual environment and influence the entire organisation. This requires both the individual and the organisation to support and implement a continuous improvement mindset. This results in a cyclical learning process that allows the individual and the organisation to develop continuously. The communication and co-operation skills of the people involved are of particular interest. These serve to communicate potential for improvement in a targeted manner and to anchor it correctly in the respective context [18]. In this context, the ability to cooperate also serves to correctly categorise the role of quality and risk management officers [19]. Depending on the organisational culture, it is important to consider which activities (can) be taken on by the organisation itself and where the network with other professions (within an organisation) should be sought. Other professions are among the first customers who need to be treated with sensitivity, expectations and requirements need to be enquired about and trust and satisfaction need to be established (customer sensitivity) [20-22].

In order to differentiate the individual competences within the group of personal competences, it was decided to divide them into 'inward-looking competences', 'outward-looking competences' and 'future-oriented competences' (Table 1).

Professional and methodological competences [25-37]

38 technical and methodological competences were identified for quality and risk management officers. These include knowledge of auditing, interviewing interested parties, concepts of quality and risk management and patient safety, complaint management, Critical Incidence Reporting System (CIRS), diagnostic capability, document management, preparation of management reviews, evidence-based decision support, error management, basics of quality and risk management (e.g. creation of mission statements), implementation of quality management programmes, implementation of quality management systems and quality management processes. Quality and risk management basics (such as mission statement cre-

ation), implementation of quality management systems, information literacy (knowing when there is a need for information, identifying the information validly and reliably and using it effectively for a given problem), healthcare institutions, key performance indicator creation and measurement, clinical risk management, competence management, continuous improvement management, standards, project management skills, process management skills, quality assurance, regulations, structured procedures, dealing with agile methods, alertness to change in the environment and value chain, knowledge of agile working and certifications.

The concepts of quality and risk management and patient safety cover a wide range of topics and form their basis. These topics range from general definitions, such as quality, customer or provider, to the definition of the various techniques and tools of quality and risk management [25]. Auditing is one of the oldest technical instruments of quality and risk management and has been used continuously under various names, such as clinical audit, medical audit or TQM audit. The basic methodological principles of the audit have remained unchanged [26]. With the help of the audit, it is possible to come into contact with different professions, jointly identify potential for change and address possible solutions. Joint development creates a basis of trust to identify and understand potential, to take the identified problems seriously and to establish the relevance of one's own actions for the organisation. Even if the time required is greater than with other instruments, the benefits for the individual and the organisation are sustainable [27].

Surveys are another instrument for making contact with many different stakeholders. Surveys of interested parties are particularly important in the context of digital transformation, as insured persons and patients, employees and other interest groups can provide relevant feedback on the further development of care structures and processes [28-31]. For the targeted introduction of (digital) innovations, it is essential for quality and risk management to support evidence-based decision-making for individuals and organisations. The evaluation possibilities of quality and risk management can be expanded and combined with methods from research areas such as health services research, epidemiology, public health or health economics. This makes it possible to evaluate individual aspects of healthcare in terms of their benefits for patients and to derive evidence-based decisions [32-34].

Due to the large number of different professional and methodological competences, the competences were divided into four subgroups: 'Quality and risk management', 'Patient safety', 'Project and change management' and 'Scientific work' (Table 1).

Competences to promote digital transformation [38-61]

20 knowledge areas were identified as digital competences. These include agile working, data analytics and artificial intelligence, dialogue and conflict skills with knowledge of digital innovations, digital ethics, digital learning, digital literacy, digital collaboration, innovation skills, mission orientation, user-oriented design, use of the digital workplace, use of standard software, understanding the differences between algorithms and artificial intelligence, understanding the differences between digitalisation and digital transformation as well as judgement and change competence for digital transformation.

The competences to promote digital transformation encompass different concepts and knowledge. Individuals and organisations must be enabled to design, understand and evaluate digital applications (digital literacy) [38]. Building on this basic digital competence, a strategy for dealing with digital innovations should exist and be continuously pursued (mission orientation) [39,40]. Within this strategy, it is helpful to differentiate between the forms of digital transformation - digitisation, digitalisation and digital transformation [41]. This distinction helps users to understand the differences between digitisation and digital transformation and which forms of change can result [42]. For the user, the evaluation of change is most strongly experienced in the usability of digital innovations (user-centred design). The determination, suitability and evaluation of usability can be carried out using different methods [43-46]. Quality and risk management officers can use these methods as part of an evaluation to supplement feedback on satisfaction with additional perspectives. Applications from the fields of data analytics and artificial intelligence offer further possibilities for analysing the results of any type of survey [47,48]. The knowledge required varies depending on the application and organisation.

The digital transformation also provides additional options for training new content. These are summarised under the terms digital learning and digital collaboration. The advantage of these approaches is the increased interactivity of the applications with the learners, the asynchronous and permanent access to content and the high acceptance of the offerings [49-51].

With the use of digital innovation, equal trade-offs must be made for individuals and organisations. These decisions can affect insured persons, patients and employees as well as the acting organisation or society. Ethical considerations in the use of digital innovations (digital ethics) [52-54], as well as safety measures, must be taken into account when designing, implementing and using digital innovations (capacity for judgement). The ability to make judgements and change competence to promote digital transformation encompasses topics from the areas of design, implementation, interoperability, operation and also security in their handling [55].

The digital transformation competences were divided into four subgroups. These are 'Basic digital competences', 'Technological competences', 'Key digital competences' and 'Transformative competences' (Table 1).

Overview of the competences

Once the assignment of the individual competences to the generic competence clusters had been completed, it was decided to rename the names of the competence clusters as operationalisable variables. The group of personal competences was renamed Personal Ego, the professional and methodological competences were renamed Professional Ego and the competences for promoting digital transformation were renamed Digital Ego (Table 1).

Discussion

The competences identified for the professional group of quality and risk management officers reflect their extensive field of activity, which will be supplemented by further competences with the di-

gital transformation. The new competences underpin the new areas of activity and support, job content and areas of work. Competences initially represent starting points for managing the transfer of knowledge. The application of knowledge is equally important in order to make target-orientated decisions based on theoretical and empirical knowledge.

The extent and depth to which the identified competencies are applied by quality and risk management officers depends on their scope of action, in particular the size of the organisation and its culture. Quality and risk management officers are called upon to examine which of the competences are performed in depth by other professional groups (ability to cooperate). In order to use these competencies sustainably for the organisation, appropriate internal networks must be formed. With the help of these networks, issues can be comprehensively analysed and a far-reaching basis for decision-making can be created. Organisations are called upon to promote cooperation between professional groups with the relevant skills and to anchor this in their organisational and management culture.

Proof of the benefits of existing competencies is highly relevant in order to ensure their effectiveness for the organisation. There are concepts and models that can be used to provide evidence of competences and identify potential for strengthening individual areas of competence [62]. This verification exceeds, for example, a training evaluation in the form of a test, is very extensive and requires a high level of time and human resources. The extent to which this can be adapted for individual organisations or applied holistically must be examined within the organisations themselves.

Other professional groups analyse their skills profile with regard to digital transformation to the same extent [63-66]. The results are comparable with the competence profile of quality and risk management officers. There is an expansion of competences to pro-

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mote digital transformation. As in quality and risk management, a loss of existing competences is not observed. In the synthesis of all results, it becomes clear that each professional group must acquire the same competences to promote digital transformation. This is understandable, as the digital transformation affects all economic sectors and professional groups. Similar competence bases across occupational groups are required in order to communicate expectations and requirements in a valid and uniform manner. The level of detail of the competencies varies depending on the individual and organisation.

The digital transformation is associated with the expectation that care structures and processes can be simplified for the user and bureaucracy reduced [67]. This possibility exists with the acquisition of the same competences in different professional groups, as the same knowledge bases exist and can be used. The dissolution of so-called 'knowledge silos' represents a great opportunity for healthcare. Care structures and processes can be designed in such a way that the necessary information is continuously available and (short-term) results are already utilised for the subsequent subprocess.

Quality and risk management is not exclusively an activity within an organisation, but can also have a control character within and across care regions. With the help of digital innovations, the redesign of care structures and the present competence profile, quality and risk management officers are enabled to support service providers and other professional groups beyond the boundaries of organisations in designing care processes for patients in a benefit-oriented manner.

Strengths and limitations

This work offers a comprehensive overview of the competence profile in quality and risk management. The requirements of the

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Kompetenzprofil für Qualitäts- und Risikomanagementbeauftragte		
Persönliches Ich	**Fachliches Ich**	**Digitales Ich**
Nach innen gerichtete Kompetenzen (Growth Mindset, selbstständiges Arbeiten, Verantwortung, Umgang mit Scheitern, (Selbst-) Organisationskompetenz, Reflexionsfähigkeit, Resilienzfähigkeit)	**Qualitätsmanagement** (Grundlagen Qualitätsmanagement (inkl. Begrifflichkeiten, KVP, Institutionen, Regularien (gesetzliche, nicht-gesetzliche) und Normen, Kompetenzmanagement und Kommunikation), Beschwerdemanagement, Qualitätssicherung, Prozessmanagementfähigkeiten, Implementierung QMS, Auditierung, Erstellung Managementreview, Befragung von interessierten Parteien, Kennzahlenerstellung und Messung, Dokumentenmanagement, Fachzertifizierungen	**Digitale Grundkompetenzen** (Nutzung des digitalen Arbeitsplatzes, Nutzung von Standardsoftware, Unterschiede verstehen zwischen Digitalisierung und digitale Transformation, Unterschiede verstehen zwischen Algorithmus und Künstlicher Intelligenz)
Nach außen gerichtete Kompetenzen (Flexibilität, Interesse gegenüber anderen, Kundensensibilität, Medienkompetenz, soziales Verhalten, Teamfähigkeit, Kooperationsfähigkeit, Netzwerkfähigkeit, Kommunikationsfähigkeit, interkulturelle Kompetenz	**Patientensicherheit** (klinisches Risikomanagement, Fehlermanagement)	**Technologische Kompetenzen** (Data Analytics und Künstliche Intelligenz, nutzerorientiertes Design)
Zukunftsgerichtete Kompetenzen (Lösungsfähigkeit, Kreativität, unternehmerisches Handeln und Eigeninitiative, Entscheidungsfähigkeit, Risikobereitschaft, Lernfähigkeit und -bereitschaft, Offenheit, Problemlösekompetenz, Veränderungsbereitschaft)	**Projekt-/ Changemanagement** (Diagnosefähigkeit, Projektführungsfähigkeit, strukturiertes Vorgehen, Umgang mit agilen Methoden, Wachsamkeit gegenüber Wandel in der Umgebung und Wertschöpfungskette, Wissen über agiles Arbeiten)	**Digitale Schlüsselkompetenzen** (Digital Literacy, Digital Ethics, digitale Kollaboration, Digital Learning, agiles Arbeiten
	Wissenschaftliches Arbeiten (evidenzbasierte Entscheidungsunterstützung, Informationskompetenz (wissen, wann ein Bedarf an Informationen besteht, die Informationen zu identifizieren und effektiv für ein vorliegendes Problem zu nutzen))	**Transformative Kompetenzen** (Urteilsfähigkeit, Innovationskompetenz, Missionsorientierung, Veränderungskompetenz, Dialog- und Konfliktfähigkeit)

Tab. 1: *Kompetenzprofil für Qualitäts- und Risikomanagementbeauftragte.*

digital transformation for this professional group are analysed and operationalised for the first time. The development of the content by the GQMG's Digitalisation and Quality Management working group is a strength of the work, as insights from different healthcare institutions, organisational sizes and organisational cultures could be taken into account. This is highly relevant in order to determine a comprehensive and at the same time targeted competence profile for quality and risk management officers. Another strength is the procedure for assigning the respective competences to the generic competence cluster. The assignment was carried out by consensus of all authors, so that the content of each competence was discussed jointly and a common understanding of its content was established.

One limitation of this study lies in the study design. By conducting a systematic review, a broader publication base could have been used. It cannot be ruled out whether a different methodological approach could have identified further competences. A further limitation lies in the designation of the individual competence clusters. Here, names were chosen by the authors. Alternatively, a name could have been formed from the individual competences of a cluster in a more inductive process. The fact that only competences and the requirements associated with them were used can also be seen as a limitation for the work. Existing areas of knowledge of individual quality and risk management officers were not used, as there are no searchable databases for this purpose.

Further questions for research

The identified competence profile provides an initial basis for enabling quality and risk management officers to access the necessary knowledge. With the help of the present results, the adaptation of the competence profile to different types of healthcare facilities can be tested. In addition, the forms and extent of cooperation with other professional groups for the promotion of digital transformation can be analysed. To this end, networks (within) an organisation can be analysed and tested with regard to their syntactic relationships. A further research question includes whether and to what extent the contents of the present competence profile exist among the quality and risk management officers of healthcare organisations. To this end, the individual competences and their interaction are to beprepared for a survey so that this can be used for organisations, regions and/or the nationwide use of all healthcare facilities.

Implications for practice

Healthcare facilities can use the results to check which competencies are available for the organisation and to what extent adjustments or expansion are required. In addition, the identified competence profile offers the possibility of being operationalised and used as a catalogue of learning objectives for further education

and training in quality and risk management as well as in the area of patient safety.

Conclusion

Analysing the competence profile of quality and risk management officers represents a critical stocktaking of their own actions and an assessment of the position between the professional groups. The increase in competences illustrates the need to acquire separate and specialised knowledge for the digital transformation. The competences identified provide a basis for supporting all stakeholders involved in the digital transformation, identifying and promoting synergies and enabling a benefit-oriented further development of healthcare for patients. <<

Author's declaration

Die Autor:innen geben an, dass keine Interessenskonflikte vorliegen.

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Promoting digital transformation in the healthcare sector. Analysis of the skills profile from the perspective of quality and risk management

Introduction: Healthcare is confronted with various challenges. The digital transformation represents both a challenge and an opportunity. Various expectations are associated with the digital transformation, which can only be achieved through high financial and personnel expenditure. Existing healthcare employees must be qualified in order to exploit the potential of digital transformation and meet expectations. However, it is unclear what qualifications healthcare employees need. The aim of this work is to analyze the skills profile from the perspective of quality and risk management and to identify further skills to promote digital transformation.

Methods: A semi-structured literature search was carried out in scientific and practioner-related databases and specialist journals. In addition, books and websites were included in the analysis in order to provide a broad publication base for the research. The competences were selected by one person and the identified competence and its assignment to the generic competence cluster was agreed with the participation of all authors.

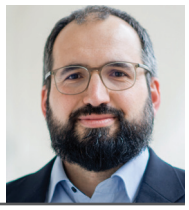
Results: A total of 89 competencies were identified for quality and risk management, which were assigned to the three generic competency clusters of personal competencies, technical and methodological competencies and competencies for promoting digital transformation. For the competence cluster of digital transformation, 20 competencies were identified, which cover topics such as digital literacy, potential uses of data analytics and artificial intelligence, the ability to make judgments about digital innovations, and will develop further facets with increased use in healthcare.

Discussion: The identified competencies expand the skills profile of quality and risk management officers and reflect their central role in managing and supporting healthcare facilities. The scope and level of detail of all listed competencies can vary depending on the organization, which is most often associated with its size and culture. In order to achieve the goals of digital transformation, personnel must be sufficiently qualified. Building on this, the present skills profile offers the opportunity to target the relevant personnel with further and advanced training courses. The extent to which quality and risk management officers qualify themselves with regard to the competencies identified should be coordinated depending on existing professional groups with detailed specialist knowledge and a culture of exchange between all professional groups should be promoted.

Keywords

Digital transformation, quality of care, competencies, quality management, risk management

Dr. rer. medic. Thomas Petzold ORCID: 0009-0005-1486-5990



ist als Referent Unternehmensentwicklung und IT-Koordination beim Medizinischen Dienst Sachsen tätig. Er engagiert sich in der Gesellschaft für Qualitätsmanagement in der Gesundheitsversorgung (GQMG) für Digitalisierung und Qualitätsmanagement.
Kontakt: Thomas.Petzold@md-sachsen.de

Katharina Ille MA



ist Koordinatorin der Hautklinik und des Hauttumorzentrums am Universitätsklinikum Halle (Saale). Ihr Masterstudium der Politikwissenschaft schloss sie 2015 ab. Schwerpunkte ihrer Tätigkeit sind u.a. Qualitäts- und Risikomanagement, Personalbudgetverwaltung und Projektmanagement.
Kontakt: Katharina.Ille@uk-halle.de

Pauline Effenberger MSc



arbeitet als Produktmanagerin bei BITWORKS EDV-Dienstleistungs-GmbH an der Weiterentwicklung der Qualitätsmanagement-Software BITqms. Zudem ist sie dort für den Bereich Recruiting verantwortlich.

Kontakt: Pauline.Efenberger@bitworks.net

Dr. rer. pol. Kerstin Rego



Consultant für Software, Fakultät für Wirtschaftswissenschaften der Universität Regensburg
Kontakt: Kerstin.Rego@ur.de
ORCID: 0000-0001-6991-0799

Dipl.-Biol. Heike Beschmann



Stabsstelle für Patientensicherheit und Qualität
Universitätsklinikum Frankfurt
Kontakt: Heike.Beschmann@ukffm.de

Jörg Siebert



Unternehmensentwicklung
Marienkrankenhaus Kassel gGmbH
Kontakt: J.Siebert@marienkrankenhaus-kassel.de

Dipl.-B.w. (FH) Oliver Steidle MA



Leiter der Stabsstelle Qualitätsmanagement und klinisches Risikomanagement
Universitätsklinik Essen
Kontakt: Oliver.Steidle@uk-essen.de
ORCID: 0009-0003-9180-8741