

STADIUM INNOVATIONS

Final report on the 2022-23 season

DFL and DFB initiative to promote innovative technologies and services in stadium, security and event operations



Forewords

**Ladies and Gentlemen,
Dear Colleagues,**

The experience of visiting a stadium on a matchday is an essential part of German football – and one of its calling cards. The emotions, choreography and sold-out stadiums in the past season as fans made their long-awaited full return following the coronavirus restrictions are examples of what makes football unique among sports.

Ensuring that this remains the case requires considerable organisational effort on the part of everyone involved on matchdays. It also means unlocking potential for various optimisations in the areas of event management, fan services, and visitor and security management.

At the same time, societal, environmental and economic challenges call for a growing focus on implementing sustainable technologies in stadium operations. With a view to sustainability, integrating corresponding regulations into the licensing process for the 2023-24 season is not just an active commitment but also an obligation on the part of German professional football. Given the size of a football stadium and the number of people attending each match, this means using state-of-the-art technologies to reduce emissions and regulate water and energy consumption.

Following on from the successful first edition of our initiative to promote innovative technologies and services in stadium, event and security operations, we are delighted to present to you the final report on the second edition. Under the direction of the DFL and DFB, the clubs again shared their experiences, tested innovations from pioneering companies in the form of pilot projects, and expanded their expertise in the areas of visitor management and sustainable stadium operations in particular.



We would like to thank the Stadium Innovations Project Group and all of the clubs and providers who were involved in the seven pilot tests in the second year of the project. We hope this brochure provides you with some new and interesting insights and look forward to continuing the initiative in the 2023-24 season. ■

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Ansgar'.

Ansgar Schwenken
Member of the DFL Executive Committee
& Director of Match Operations & Fans

**Ladies and Gentlemen,
Dear Colleagues,**

A safe stadium experience full of emotion, passion and excitement is what we work for – continuously and professionally. This includes thinking outside the box. Where can we still improve things? What will make trips to the stadium even more pleasant, more comfortable, and ultimately safer for the millions of matchday visitors every season?

Together with the DFL, we established the Stadium Innovations Project Group to enable us to advise and support organisers and security officers as effectively as possible. We take a service-oriented approach to seeking out new and creative ideas and products. With a focus on football, we identify potential candidates and examine them as part of a voluntary cooperation with the participating clubs and the providers from the world of business. Where it is relevant and makes sense to do so, we provide tips and suggestions on how to initiate or advance developments for the benefit of our football organisers.

The upcoming third phase of this cooperation looks set to include more interesting pilot projects that will represent helpful, sensible or even essential additions to our events as we work to ensure that we remain fit for the future and continue to offer safe and attractive football matches. Our aim is to keep encouraging our clubs and providers to actively participate in this phase. We ideally want to save many organisers and security officers the unnecessary and time-consuming effort of looking for solutions. Challenges and solutions are contributed transparently by all of the parties involved. This is not something we take for granted, and it ultimately benefits German football as a whole – especially when it leads to improvements in security. As such, we would like to take this opportunity to thank all of the participants.

This second project group report summarises the experiences of the many positive developments that have taken place. If you have any observations, questions or



suggestions, the DFB, the DFL and the project group will be happy to hear from you. We hope this report provides you with interesting and illuminating reading as we show you how we make sure our event management is always on the ball. ■

On behalf of the DFB security team,
Yours sincerely,

A handwritten signature in black ink, appearing to be 'HGL'.

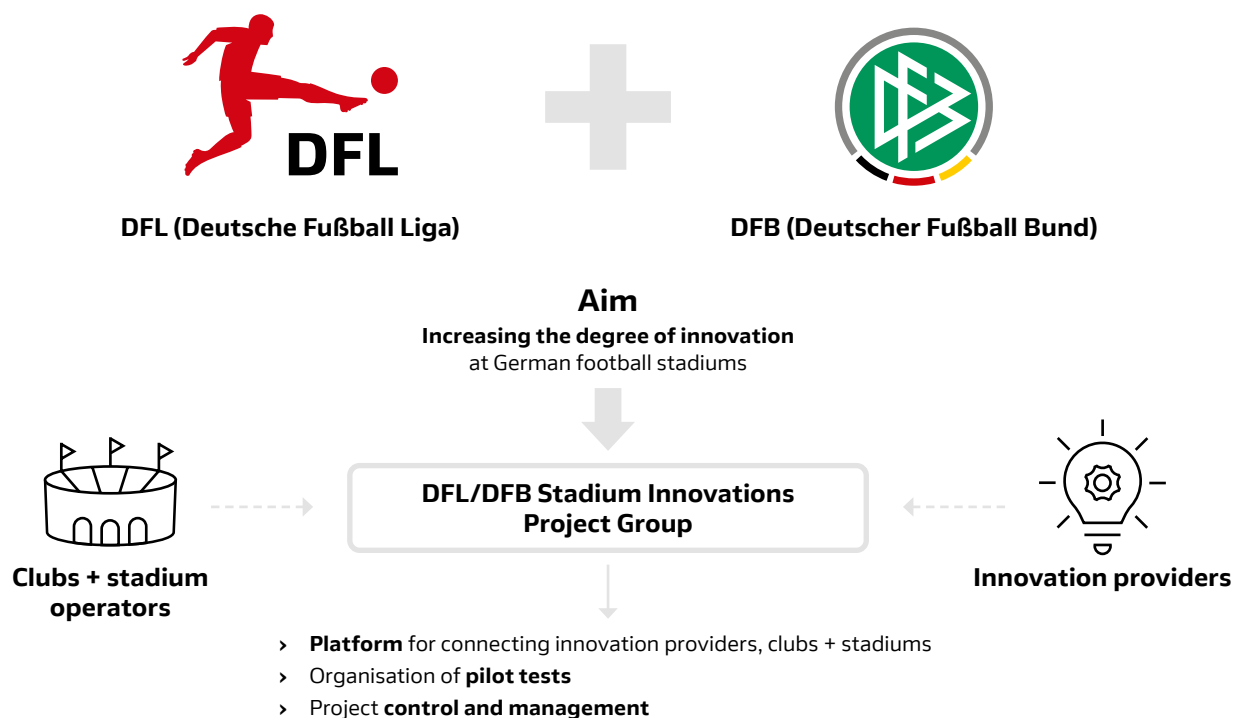
Hendrik Große Lefert
DFB Security Officer

Project presentation

In January 2021, the DFL and the DFB jointly launched an initiative to promote innovative technologies and services in stadium, security and event operations. The aim of this initiative is to increase the degree of innovation at German stadiums while offering clubs/stadium operators and innovation providers a platform for networking and sharing knowledge.

The project cycle is as follows: Every year, providers put forward new and innovative technologies to be tested in the form of a pilot project. Interested clubs then work with the selected providers to try out the technologies in practice and share their experiences. Information on which technologies are being tested at which locations and which results were achieved in the respective tests is communicated transparently to the other clubs in order to facilitate a permanent exchange of knowledge in a spirit of mutual cooperation. ■

Visualisation of the project structure





Provider selection

A standardised application form was sent out to potential providers in order to obtain an initial overview of the providers and their innovations. The required responses included a general description of their innovation and its objectives as well as a presentation of the cost-benefit ratio. 15 providers submitted applications covering a total of 18 innovations. All of the applications received by the deadline were subsequently presented to the clubs in order to obtain an initial assessment of their innovative character

and their relevance for stadium operations. Additionally, innovation providers had the opportunity to showcase their products to interested clubs in 1-to-x discussions.

Since the current cycle, providers have also been able to join the project group with innovation projects during the season or be pencilled in for the next project cycle. A further four providers joined in this way during the current season. ■

Automated access control for matchday staff using facial recognition

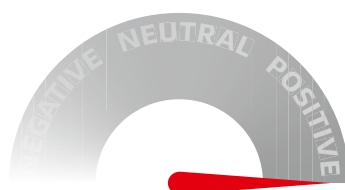


Key data

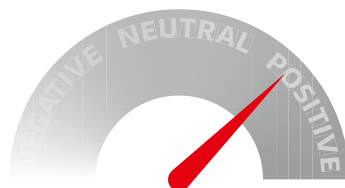
Club	Borussia Dortmund
Contact	Lorraine Meccanico (lorraine.meccanico@bvb.de)
Innovation partner	Deep Impact AG
Contact	Stefan Bebié (stefan@deep-impact.ch)
Duration of test phase	3 March 2023
Date of site visit	3 March 2023



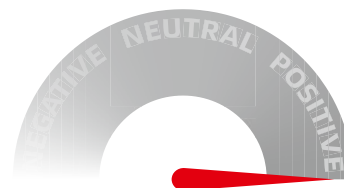
Assessment
by the club
participating
in the pilot



The innovation offers added value for the club



The innovation is being considered for continued use or permanent purchase after the test phase



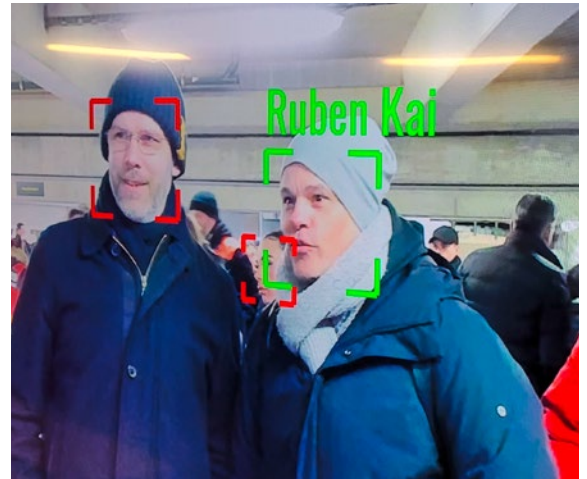
The innovation can be recommended to other Bundesliga, Bundesliga 2 and 3. Liga clubs

More efficient access control using **facial recognition**

The pilot project to test automated facial recognition for the accreditation of matchday staff proved to be promising.



Pilot setup for the checkpoint: A single camera plus a laptop
The accreditation credentials are displayed on the screen
(see adjacent photo)



Demonstration of facial recognition. Green means the face is recognised and the person is accredited. Red means the face is recognised and the person is not accredited.

Description of the innovation

Automated accreditation using facial recognition of matchday staff – who already need access to the stadium for a long period of time before the stadium opens for spectators – makes access control more efficient. Furthermore, it increases security and reduces payroll costs for clubs. When checking in, temporary employees are compared with the data and profile photographs stored in the system.

increased security by reducing the potential for errors compared with manually checking people against their photographs. The expected time saving is 5–10 seconds per employee in conjunction with improved error prevention.

Pilot phase timeline/ resources

Intensive coordination took place between the data protection officers at BVB and Deep Impact, followed by clarification with the commissioner for data protection for North Rhine-Westphalia state. After that, BVB transmitted the photographs of its security staff to Deep Impact. The pilot was conducted with BVB's security staff on a matchday. The necessary camera and software were supplied by the provider.

Investment volume

The one-time purchase cost of the system is a low to medium five-digit amount, depending on the IT system landscape and hardware integration. The monthly operating costs amount to around EUR 2,000.

Potential benefits/ expectations

The introduction of digital facial recognition significantly accelerated the employee check-in process, resulting in shorter waiting times to enter the stadium. It also

Assessment of the innovation from the association's perspective

The pilot project found the automated facial recognition system for the accreditation of matchday staff, including security and catering staff, to be extremely promising. By minimising sources of human error and effectively reducing the potential for abuse, the level of security is considerably higher than at present. The system also makes it much quicker to check in large numbers of security and service employees to the stadium while also ensuring improved accuracy. The inspection process for each employee can be completed in just a few seconds, with facial recognition for accredited persons taking place in a fraction of a second (100 ms). ■

Outlook

The project team is fully satisfied with the progress of the project in the second edition. The positive response from the clubs and the participating providers serves as an endorsement of the DFL and the DFB's decision to initiate the Stadium Innovations Project Group.

The next season in the top three leagues will be interesting in many respects. It will be the first full season after almost all of the hygiene measures relating to the coronavirus were lifted. Ten German stadiums are also preparing to serve as UEFA EURO 2024 venues.

The project group will continue its work next season. Several providers have already expressed an interest in showcasing themselves and their products to the clubs, and an official call for applications will be published shortly. We look forward to hearing from exciting innovation providers from around the world and contributing to an innovative, modern and sustainable German stadium landscape. ■



DFL/DFB Stadium Innovations Project Group

The operation of sports facilities attended by large audiences involves a number of organisational challenges. Under the direction of the DFL and DFB and in cooperation with the clubs, the Stadium Innovations Project Group

tests and evaluates innovations in the area of stadium operation and management. It also investigates the extent to which solutions from other sectors can be applied to sports facilities. ■

Vision

An innovative, modern and future-oriented stadium landscape for Germany

Mission

To increase the degree of innovation at German football stadiums by

- **channelling, collecting and categorising provider applications in the area of stadium innovations**
- **establishing a regular dialogue and transfer of expertise between clubs, associations and innovation providers**
- **testing and evaluating innovative products and services**

The initiative is composed of cross-functional experts from the clubs and associations. Industrial providers engage with the challenges set by the clubs and stadium

operators and supply relevant technologies and services with the aim of optimising various areas of stadium operations. ■

Applications submitted to the project group

21

participating
clubs

36

innovations
submitted

12

innovations
tested

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