

Cricket Injury Prediction and Surveillance by Mobile Application Technology on Smartphones

Najeebullah Soomro¹, Habib Noorbhai², Mariam Soomro³, Meraj M. A. Chhaya⁴ and Ross Sanders¹

¹*Discipline of Exercise and Sport Science, Faculty of Health Sciences, The University of Sydney, Lidcombe, NSW, Australia*

²*Department of Sport Management, Faculty of Business, Cape Peninsula University of Technology, Cape Town, South Africa*

³*APPNA Institute of Public Health, Jinnah Postgraduate Medical Centre, Karachi, Pakistan*

⁴*Academy of Computer Science and Software Engineering, University of Johannesburg, Gauteng, South Africa*

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Abstract: Name of the mobile Application: CricketPredict.

Category of the mobile Application Health and Fitness: Platform Android 4.0 or later, Cost Free.

The aim of this paper is to present the methodology for the development of a mobile App on injury surveillance and workload monitoring in Cricket. This technology is not available for complimentary use to the general public; therefore this App can assist in capturing injury data at all levels of cricket electronically. The CricketPredict mobile App for Android smartphones was developed using three languages C++, Qt Modeling Language (QML) and JavaScript.

CricketPredict is the first complimentary mobile App that can record injuries in cricket through a smartphone. The injury questionnaire is tailored to cricket and the App can also record batting and bowling workloads, which can be risk factors for injury. The App can be used without the need of supplementary computer devices for synchronization, making its usage practical on the cricket field.

Electronic injury surveillance systems have been shown improve data collection during competitive sport. Therefore CricketPredict mobile App may assist in better reporting of injuries at junior level and may also act as a monitoring system for coaching staff to adjust training workloads of individual players.

1 INTRODUCTION

Emerging technologies are creating new opportunities to apply science and medicine to high performance sports (HPS) (Speed, Roberts 2010) Multiple sports have used technology to monitor and predict injuries in sports (Karlsson, 2015).

Electronic injury surveillance and monitoring tools are also used in cricket, for example, Cricket Australia (CA) uses the Athlete Management System (AMS) for workload monitoring and injury reporting for their contracted players. There is a high burden of injury at the junior levels of cricket; a five year investigation of injuries in elite junior cricketers in South Africa indicated that 27% of the cricketers sustained injuries (Stretch 2014). Since there are no structured electronic monitoring mechanisms available at the junior levels therefore it is important

to develop a system to track injuries and workloads at the junior level.

Monitoring training workload by using subjective measures from an athlete is shown to be an effective way to address the issue to training load quantification in sports (Saw et al. 2015). Considering this evidence, if players can record their bowling and batting workloads it may assist to reduce the burden of overuse injuries. Currently there are no complimentary mobile Apps available in the public domain which can record cricket related injuries and monitor workload, therefore development of one is necessary.

The aim of this paper is to define and describe the novel methodology and protocols associated with the development of CricketPredict, a complimentary and easy to use smartphone based Mobile App for monitoring injuries and workloads at community level.

2 METHODS

The CricketPredict software system design was conceptualized to be divided into three components: a player interface, a coach interface, and a back-end system that securely stores all the data. The design of the software relies on client-server architecture, with the player and coach interfaces operating as clients and the back-end system operating as the server (resource and service provider). The implementation-level details are expanded in the following sub-sections.

The client-side has been built in a manner that can simplify porting it to diverse smartphone operating-systems, with the initial release aimed at the larger Android ecosystem. The server-side of CricketPredict was implemented to also be compatible with various server operating systems, in order to reduce dependability upon a single technology. Qt 5.3, which is an open-source software development platform, was chosen to program the functionality of the client-side software because of its cross-platform compatibility (ability to work on multiple operating systems). This means that even though the initial release is compatible with Android only, the source code can later be ported to 15 other operating systems with relative ease. The aforementioned platform and languages simplify the construction of custom-user interfaces, and provide the opportunity to augment user-interface components with high-level logic. PHP, a cross-platform server-side scripting language was used as a server.

The user interface provides an injury recording tool based on Finch et al. 2010. The form has questions on the activity at the time of injury, reason for presentation, site of injury, nature and mechanism of injury, etc. Injury reporting forms appearing the player's interface are shown in Figures 1. The App also records workloads for batting and bowling. For batting, the number of balls batted was the primary input and for bowling the number of balls bowled was the primary input

3 CONCLUSIONS

Use of eHealth and online technology to monitor and track athlete's health has been identified as an area that can revolutionize Sports Medicine (Verhagen et al. 2014). The development of CricketPredict Mobile App was inspired by this concept and is the first complimentary Mobile App that can record injuries in cricket through a smartphone without the need for

connectivity from parent software on computers. The App was tested multiple times by the developers, players at the University of Sydney Cricket team and random users. The data collected by the App was cross verified with the data stored on the server by the developers and the results showed that 100% data accuracy. User reviews were collected from five ransom testers who rated the user –friendliness of the App as 8.2/10.

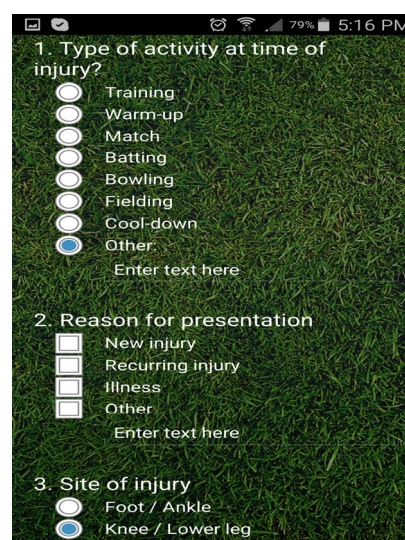


Figure 1: Injury reporting tab on the player's interface.

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