











developed thus far. These rules are applied to check the individual parcels and their relationships with other parcels. These validation rules have been formalised using mathematical expressions and are being tested with different data sets. This study shows that due to the complexity of 3D cadastral objects, a large number of validation rules are required to cover various scenarios.

## 6 Conclusion and future directions

This paper explored the current progress of the ePlan project in Victoria, Australia. Currently, the subdivision plans can be submitted to SPEAR in ePlan LandXML format, which is an intelligent digital data. As compared to PDF plan, an ePlan file provides the subdivision process stakeholders with many benefits such as providing pre-lodgment checks via validation report, eliminating the drafting step from plan preparation via visualisation service, standardising the presentation of plans, eliminating the duplication of drawing files by storing all required data in computed plan, speeding up the application creation process in SPEAR, saving time in constructing the subsequent surveys by having access to digital files, pre-populating the Victorian Online Title System (VOTS) and automating the creation of new titles, reducing lodgment to registration turnaround time, providing the data for digital plan examination, and upgrading the spatial accuracy of map base.

This paper also discussed the main challenges that have impacted the uptake of ePlan in this jurisdiction. The most critical challenges include the surveyors acceptance of adopting a new method of producing plans, quality of the visualisation service, which converts the ePlan LandXML file into PDF as the legal title diagram, and support for 3D building subdivisions. The paper also introduced the research programs defined by the ePlan team in order to address the ePlan challenges. The research programs discussed in the paper include the ‘ePlan Engagement Program’, which aims to gain a greater understanding of surveying firms’ subdivision processes and how ePlan can fit into them, the development of an online tool through the collaboration with the University of Melbourne to empower surveyors to improve the plan presentation of the PDF plan visualised from the ePlan data, and the investigation of the technical aspects of a 3D digital cadastre for Victoria comprising 3D data modelling, validation and visualisation components.

In addition to the above research programs, the ePlan team will continue to enhance the quality of its current ePlan visualisation service. Supporting the field notes (known as abstract of field records) in ePlan format, and designing an Oracle database for storing registered ePlan files are on the ePlan team’s agenda for 2017. The ePlan team will also continue its collaboration with the Office of Surveyor General on a pilot project to utilise back captured plans in ePlan format for upgrading the spatial accuracy of the Victorian Mapbase.

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