Preliminary DSS Stakeholder Analysis – towards the Scion SFF proposal for site-species matching

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FOREST GROWERS RESEARCH

EXECUTIVE SUMMARY

The purpose of this study was to conduct an end-user stakeholder analysis about the usage of Decision Support System (DSS) tools for alternative species decision making. The specific objectives were to identify from end-users what they require from a DSS tool, what they use today, how they rate those tools and what technologies they use to access information about alternative species.

The main finding from the interviews was that stakeholders outsource decision making services to consultants or call on internal knowledge. Most farm foresters will rely heavily on consultants, councils or their own knowledge and or conduct their own research via websites and tools. It was also discovered that commercial operations will host their DSS tools externally to enable them to leverage their hosting resource and allow remote access while in the field.

The conclusion from this study is that both commercial foresters and farm foresters used consultants for support and advice. All end users we spoke with used either a DSS tool of some kind or a paper based decision making framework. End-users requested any future tools developed should provide them with simplicity of use and outputs, at a scale relevant for their operations, preferably accessed via the web or from a mobile device, compatible with other business systems and technologies.

INTRODUCTION

This report has been commissioned by the Specialty Wood Products Research Programme with the purpose of engaging with end-user stakeholders to identify their requirements for DSS tools. The intention is to inform future DSS tool development for alternative species or the enhancement process for existing tools. Results from this stakeholder analysis will be used as a resource to write the Scion *Sustainable Farming Fund* (SFF) for site-species matching.

DSS are characterised as computer based information systems that provide solutions and or alternative scenarios for business decision making purposes. As new research and technologies emerge and user demographics change, DSS tools change to keep up with end-user demands for continued access to new data and enhanced user experience. Alternatively, DSS may become less relevant if the underlying data or the platform fails to keep pace with changing needs of end users.

DSS tools for the forestry industry span all aspects of the forest value chain from species selection, inventory management, silviculture and regime management through to harvesting, health & safety and fire protection.

There are a few DSS tools for commercial operations, such as Forecaster, YTGen, GeoMaster; and DSS calculators for some alternative commercial species like cypresses, eucalypts and redwoods, all of which are located on the Farm Forestry Association (FFA) website. There are also calculators developed by the Diverse Forests Programme, hosted on the Future Forests Research (now Forest Growers Research) website. These current DSS tools known as calculators are a series of excel spreadsheets and have remained static and unchanged.

It is important to ensure that as new technologies and platforms emerge, DSS tools used today continue to be relevant and if development is required the needs of the end-users are taken in to account.

METHODS

Forestry practitioners and stakeholders were contacted by email or phone call and invited to partake in an informal interview. A short description/definition of what a DSS tool does was provided prior to the interview (see Appendix A).

Interview candidates were selected to cover three main targets: commercial forest owners, farm forestry owners and diversified forestry activities (councils, harvesting, etc.). In total, eight interviews were conducted with the following people:

Commercial Forest owners
- Tony Morris (JNL)
- Sean McBride (JNL)

Farm Forestry Owners:
- Gordon Williams (Landcorp)
- Denis Hocking
- Angus Gordon

Diversified forestry activities:
- Glenn Moir (Forest Management Limited)
- Patrick Milne (Forestry Consultant)
- John Jamieson (Horizons)

Additional informal information was gathered from Dean Satchell as the subject matter expert for the Farm Forestry Association website. Melissa Evans also attended the Farm Forestry Conference held in Fielding in April, 2017 to informally talk with farm foresters during the event.

The development of the qualitative questionnaire used Moore and Benbasat (1991) adoption of IT tools theory, which looks at the aspects of adoption for compatibility, flexibility within the business context, potential users, trial prior to purchase, advantages of use, and data security. Additional questions were specific to the identification of specific technologies currently used, expectations and feedback on those technologies.

RESULTS

The results are broken into three main themes: *Available DSS Tools, Technology platforms and DSS Tool expectations.* We asked all respondents specific questions around what they require from a DSS tool, what they use today, what rating they would give those tools, and what technologies they use to access information for alternative species. We also gave each respondent to opportunity to share feedback and thoughts on how they access information today about alternative species.

Available DSS Tools

We asked respondents to share with us current DSS tools used within their forestry operations and their experiences using those tools identified.

The experiences gathered from the respondents were varied, one tool was rated markedly differently for two users on ease of use, easy to install and providing useful outputs. Other users were mostly happy with the way the DSS tools provided the information outputs to them for decision making. Calculators featured highly in the interviews, with 70% of the respondents referencing specific calculators (as per below) to assist with their decision making.

One respondent did not use DSS tools for their alternative species decision making and preferred to use their extensive experience and internal knowledge, and the advice of consultants. Their small forestry estate is well described and they rely on their long history of growing expertise. This respondent mentioned that they work with trusted consultants and conduct their own research using publications and texts for their decision making for future plantings and stand management.

The following tools were identified and raised by respondents within the interviews.

- Forecaster (Scion)
- YTGen (Silmetra)
- Folpi
- Atlas Geomaster (Integral)
- Atlas Cruiser (Integral)
- GenSelector (RPBC)
- Radiata Calculator (FFR)
- Calculator (FFR)
- CYANZ
- StandPak (FFR/Scion)
- "Euan Mason" web tool
- Forecaster Calculator (Scion/FOA)
- Fire Behaviour App (Scion)
- Douglas-fir Calculator (FFR)
- ArcGIS (ESRI)
- CRM (SugarCRM)
- Mango H&S App
- Overseer (MPI/AGResearch/Fertiliser Assoc.)
- Farmax (AgResearch)
- TUMONZ
- Wilding risk calculator
- 300 Index (Scion)

The tools used frequently (by more than 1 respondent) and put forward as their "go to" tools for forestry application were:
- YTGen
- Radiata Calculator, D-fir Calculator and the series of FFR calculators.

This shows the wide variety of DSS tools being used by end users.
Six respondents use their chosen DSS tool on a weekly basis, and the main reason for choosing their favoured DSS tool is due to being viewed as an "industry standard". However, it is clear there is little in the way of any "industry standard" tool in terms of a comprehensive DSS that all stakeholders are using. The majority of respondents use DSS tools for one particular area of the value chain such as growth/form and yield calculators (YTGen, various species growth calculators) and or geospatial DSS tools (GeoMaster, ArcGIS, TUMONZ) for mapping. The commercial foresters and forest consultant objectives are vastly different to that of a farm forester. Commercial

foresters will utilise and adopt DSS tools more widely due to their domain expertise and requirements to meet specific financial objectives. One commercial company have adopted the use of a customer relationship system (SugarCRM) to track their teams and clients and to help with sharing data across their teams in different geographic locations throughout New Zealand.

The farm forester objectives are related to the primary domain and inclined to dabble with DSS tools, collect forest data manually and seek out advice from specialist consultants to assist with the decision making process. One respondent stated that they "don't want to reduce farm size" and that decision making is based stock units and returns.

Technology Platforms

All respondents have access to the internet. 80% of respondents stated that they use one or a combination of laptop, tablet, hand-held device (android and Apple) or PC and all carry mobile phones while in the field. In some cases they access specific applications via their mobile devices, such as GeoMaster or the fire behaviour application. The Allegro or data loggers were also mentioned as the go to device while in the field, although some still use paper and pen to collect measurement data and then later transcribe into an excel spreadsheet.

One respondent utilises the services of a consulting/hosting provider to host the applications they use in a cloud environment, this allows the company to access their DSS tools while in the field or remotely while travelling. The decision to outsource was due to their infrastructure and resource limitations and it was decided that savings could be made and investment could be diverted to other areas of their operation.

DSS Technology Expectations

All respondents provided feedback on their expectations for DSS tools and the technologies available today.

Key expectations identified by respondents were the need to ensure that the data outputs generated are compatible with other existing systems, such as the overlaying of farm data with mapping software and other data types such as temp, rain fall, sun hours, soil, etc. Additionally the right scale is important for end-users and any DSS tool developed needs to work at the farm level and take into account their land use requirements such as Ebit, carbon and afforestation. Another point that two respondents made was DSS tools need to allow end-users to enter in actual off the farm data. Using models for predictions was not favoured by farm forestry respondents.

When asked about rating current tools, simplicity featured highly. Two respondents said that a basic tool should be developed to start the conversation or provide the user enough information to seek out further knowledge or engage with a consultant.

Platform agnostic for delivery was important and web-based DSS tools were favoured by respondents due to accessibility anywhere and anytime, along with compatibility access across all devices from personal desk top through to mobile device was seen as a must.

There was discussion around where applications should be hosted and cost of development was raised by one of the respondents. Not only costs, but also transparency of development was emphasised. Additionally, when asked about maintenance and charging for access they acknowledged that this is a difficult area to clarify in terms of costs. Additionally one respondent commented that once the tool was completed and the outputs validated it would not need future re-development or changes.

Key Comments

The below are comments made by respondents during or at the conclusion of the interview.

- *"Farmers want actuals" and not averages or modelled answers. They want to know how the answer was derived via simulated scenarios on their farm.*
- *Farmers want to be able to add in their own data. For example they know their sunshine hours, rainfall, soils and would like to change the dials.*
- *Tools need to be simple and not over complicated to use. Over complicated tools end up in a cupboard!"*
- *Robust economics is needed and a costing model that is updateable by the farmer*
- *Farmers are not foresters*
- *"How are we interest young people in planting?"*
- *"How do we get younger generation thinking about planting or replanting in the future?"*
- *Farmers today have bigger farms and less resources to spend time on forestry*
- *Farmers want to know "where are they making money?" and "where are they losing money?"*
- *"Nothing is better than speaking to someone"*
- *"FFA is a huge resource, but it is tinged with bias"*
- *"No farmer wants their farm to reduce in size"*

CONCLUSION

- Commercial foresters and forestry consultants use a combination of forestry DSS tools (GeoMaster, YTGen, Geospatial mapping tools and Excel based calculators) and experience and knowledge for their decision making processes. This group are more likely to utilise DSS tools within their operations as their level of understanding within the forestry domain is high.

- Councils use a mixture of current farm DSS tools (e.g. overseer, Farmax) and other tools that they have customised. They have used forestry DSS tools (StandPak, 300Index, calculators) in the past but no longer rely on them.

- Farm foresters seek out knowledge via consultants, councils or online research for guidance and advice. This is due to farming being their primary area of speciality, while forestry knowledge is not their area expertise. Additionally this group are more inclined to gather specialist advice for all aspects of their farm operations and then make decisions based on this advice.

- While developing DSS tools for farm foresters they need to allow end-users to enter in actual off the farm data and allow the end-user to change the values to match to their farming operations.

- End-users requested that DSS tools developed in the future must provide simplicity of outputs, at a scale that is relevant for their operations, easy to use (simple design) preferably accessed via the web or from a mobile device, compatible with other business systems and technologies through the transfer of data from one system to another. These aspects strongly relate to the principles of perceived characteristics of innovations that assist in ICT uptake (refer Appendix B).

ACKNOWLEDGEMENTS

REFERENCES

Moore G.C. and I. Benbasat, 1991. Development of an instrument to measure the perceptions adopting an information technology innovation, Information Systems Research, 2(3): 173-191

APPENDICES

Appendix: A – DSS definition

A computer-based information system that supports business decision-making activities, such as sorting data and selecting optimal solutions from a selection of alternatives.

Appendix: B – Perceived Characteristics of Innovating

The seven key constructs which Moore and Benbasat (1991) call *"the perceived characteristics of innovating"* or PCI, that influence adoption of information technology: *Relative advantage*; *Ease of use* (similar to complexity, but encapsulates the users perception of degree of an innovation being free of effort); *compatibility*; *image* (the perception that using an innovation will contribute to increased social status); *trialbility* (the perceived ability of adopters to experiment with an innovation prior to purchase or committing to use); *result demonstrability* (the tangibility of the results of using an innovation; and *visibility* (the extent to which the adopters see the innovation as being visibly adopted). [Note that the last two are a further deconstruction of Rogers' original *observability* characteristic.]