Modelling of Stakeholder Participation in the Centre for Food Innovation

T.K.C. Hay[a], N.J. Curtis[b], T.T. Moon[a] and E. Lewis[c]

[a]Defence Science and Technology Organisation, PO Box 147 Scottsdale, TAS 7260 AUSTRALIA
[b]Defence Science and Technology Organisation, PO Box 1500, SA 5111 AUSTRALIA
[c]University of New South Wales at Australian Defence Force Academy, PO Box 7916 Canberra, ACT 2610 AUSTRALIA
Email: theresa.hay@dsto.defence.gov.au

Abstract: The Centre for Food Innovation (CFI), established in 2013, comprises a partnership of Defence Science and Technology Organisation (DSTO), Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the University of Tasmania (UTAS). The purpose of the CFI is to provide a regional focus for research, education and training in support of the northern Tasmanian food industry. DSTO, CSIRO and UTAS have different institutional charters, strategies and internal operational processes. The partners' individual objectives for requirements of the CFI will need to be accommodated in any decision-making models. In addition, there is a plethora of other potential stakeholders: primary producers, small to medium enterprise (SMEs) processors, industry groups, and Federal, State and local Governments. The development of governance, industry engagement mechanisms, and the building and prioritisation of a research portfolio will require input from and consideration of this broad stakeholder community.

We have used the techniques of 'Soft' operations research to guide the establishment of the process and engagement model. This is classic problem structuring, where the route to achieving an agreed way forward is as important as, if not more than, the resulting outputs: selection and prioritisation of research projects, funding mechanisms, or location of facilities. These output decisions are not logically deducible, for instance the three aspects of research, education and training providing different emphases, while the stakeholder community will impart their specific beliefs and desires. Significant features of a successful planning process include shared understanding, mutual appreciation of interests, joint commitment and visible communication channels all leading to establishment of the sound stakeholder engagement process.

The purpose of this study is to share stakeholder perspectives in order to identify commonalities and differences in their goals, objectives and understanding of the CFI, and then move towrds a common shared vision for the collaboration. Soft Systems Methodology (SSM) provides an auditable, credible and transparent way to undertake this task. Stakeholders will have greater buy-in of and commitment to the common vision, if they believe that the appropriate first steps have been made in a reasonable and sound manner. SSM uses the concept of a 'system' as an interrogative device that enables debate amongst concerned parties who learn their way from finding out about the situation to taking action to support it. SSM is grounded in theory, has a well detailed methodology, and generates models. The models are an ideal way to share stakeholder perspectives and to understand the effects and interactions of the many complex systems that make-up this problem space.

This paper decribes the learnings and insights from the initial phase of this SSM study. We undertook an action research process of developing initial models from each of the key stakeholders perspectives. Facilitated workshops, distributed due to geographical issues, were then held with individual stakeholders to gather feedback and adjust the models accordingly. A final model was then developed to accommodate a shared stakeholder perspective. SSM provided an excellent framework to explore perspectives and identify differences amongst the CFI stakeholders. An activity model was developed which provides an initial shared perspective or 'common' model for the key stakeholders. This 'common' model could then be used as the basis for a workshop to discuss goals and perspectives of the CFI, or used by key decision makers to establish CFI structure, processes and procedures which attempt to factor in this shared common vision. This would better position the CFI to establish organisational structures and processes that better enable a successful future.

Keywords: *Problem structuring, soft systems methodology*

1. INTRODUCTION

The DSTO Strategic Plan 2013-18 emphasises the need for greater collaboration and partnership with other research organisations and industry. Collaborating with industry assists the smooth transition of research outcomes for commercial development, and helps support ADF capability. To increase critical mass in the area of nutrition and food science, DSTO has entered into a collaborative research agreement with CSIRO and the University of Tasmania (UTAS) to work through UTAS's Centre for Food Innovation (CFI). The CFI collaboration has a broad stakeholder community, including the three key research partners, the agri-food industry, and local, state and federal governments. In addition to the multi-perspectives, cultures and beliefs brought to the CFI by the diversity of stakeholders, the current political and social environment around the CFI is in flux. Recent restructuring in the Tasmanian forestry industry has left regional areas struggling economically. *Australia in the Asian Century,* a white paper released in OCT 2012 (Australian Government, 2012), identifies opportunities in the Asian markets for Australian foods. Tasmania requires an innovation culture and capabilities in food processing to capture opportunities in the food export market.

The multiple perspectives of the many stakeholders and the fluxing social and political environment will influence the decision making processes of the CFI, such as funding mechanisms, location of facilities and prioritisation within the research portfolio. The CFI problem space could be described as a mess (Ackoff, 1979), or a wicked problem (Australian Government, 2007). It is a dynamic situation that consists of complex systems of changing problems that interact with each other. To assist decision making it is first necessary to structure the problem space in order to frame and define the issues constituting it. Several methods are available to support stakeholders reach a shared understanding and joint agreement (Rosenhead and Mingers, 2009). Modeling and group facilitation (Rosenhead, 2006), can help reveal the 'invisibles' of the stakeholder perspectives, and deliver 'visible' outcomes (NATO, 2012).

The purpose of this study is to share stakeholder perspectives in order to identify commonalities and differences in their goals, objectives and understanding of the CFI, and then move towards a common shared vision for the collaboration. If this process is done in an auditable, credible and transparent way, stakeholders will have buy-in of the common vision, believing that appropriate first steps have been made in a reasonable and sound manner. Checkland's Soft Systems Methodology (SSM) (Checkland and Poulter, 2010) has been used extensively in situation where there are divergent views about the definition of the problem. SSM uses the concept of a 'system' as an interrogative device that enables debate amongst concerned parties (Ackermann, 2012, Rosenhead and Mingers, 2009), who learn their way from finding out about the situation to taking action to support it. SSM is grounded in theory and has a well detailed methodology. The generation of 'squeezable' models (Curtis et al., 2006), in SSM, is ideal to share stakeholder perspectives and to understand the effects and interactions of the many complex systems that make-up this problem space.

This paper describes the learnings and insights from the initial phase of this SSM study. We undertook an action research process of developing initial models from each of the key stakeholders' perspectives. Facilitated workshops (Franco and Montibeller, 2010), which were distributed due to geographical issues (Morton et al., 2007), were then held with individual stakeholders to gather feedback and adjust the models accordingly. A final model was then developed to accommodate a shared stakeholder perspective. The final model can be used to assist decision makers develop CFI structures, processes and products which engage the diverse stakeholder community, helping to create a successful collaboration.

2. THE STATED ROLES AND FUNCTIONS OF THE CENTRE

The CFI, launched in April 2013, is a UTAS entity based in Launceston at the UTAS Newnham campus and linked to DSTO-Scottsdale in North East Tasmania through a collaborative agreement. The CFI, led by a foundation director and operated under a Collaborative Research Agreement with DSTO and CSIRO, will build future regional food networks. DSTO's key interest is to leverage CFI academic input into the program to improve the performance and well-being of ADF personnel. Through the CFI collaboration, new Defence feeding solutions will be developed, and technology transfer to industry will be increased. CSIRO's food and nutrition capability has a significant presence in Werribee, Victoria, including large scale pilot plants and laboratories. CSIRO forms a key link for the CFI to the national capability in food research, as the existing laboratory and pilot-scale capacity for industry is very low in Tasmania. This limits the ability of small businesses to innovate and test markets with trial product. The CFI will also collaborate with regional bodies and industry to form a 'Food Innovation Factory' network with pilot trial facilities.

3. GOAL OF THE SOFT OPERATIONS RESEARCH AND POTENTIAL METHODS

A collaborative research agreement between DSTO, UTAS and CSIRO takes place within UTAS's Centre for Food Innovation (CFI). In addition to the three key research partners, the CFI has a broader community of stakeholders in the diverse agri-food industry, and in local, state and federal government. For this collaboration to be successful the stakeholders will need a shared common vision for the CFI. A shared vision will be evident through the visible and invisible aspects of this venture. The visible aspects (NATO, 2012) of the collaboration may include a model for the CFI processes, a research portfolio with an agreed prioritisation scheme, record and attendance at meetings, and a strategy plan. The invisible aspects (NATO, 2012) of the collaboration are less tangible and may include accurate communication, appreciation of others' values and perceptions, and a shared understanding of the situation and a mutual appreciation and commitment on the way ahead.

The purpose of this study was to ascertain the perspectives and goals of stakeholders within the CFI, to identify any differences which may affect the collaboration, and to move towards a shared common vision. SSM was used to understand both the visible and invisible aspects of the goals, culture and belief systems of the different stakeholders, and activity models developed for each perspective. Potential stakeholders in the CFI, such as representatives from DSTO, CSIRO, UTAS, primary producers, small to medium enterprise (SMEs) processors and local, state and federal governments were engaged for this study. The insights gained from this study could be used by decision makers to establish CFI structure, processes and procedures which are based on a shared common vision amongst stakeholders, better positioning the CFI for a successful future. While this study seeks to appreciate and analyse what is happening in the problem space of the CFI collaboration, it does not include assessment or an action plan of the CFI collaboration.

4. APPLICATION OF THE MODELLING TECHNIQUES

A detailed description of SSM can be found in Checkland and Poulter (2010). Briefly, the key steps are: think 'problem space' not problem; find out about it using rich pictures (Bell and Morse, 2013, Berg and Pooley, 2013) and three analyses - Analysis 1 – the intervention, Analysis 2 - social, Analysis 3 – political; think of some relevant systems of purposeful activity and name the Weltanschauungen (worldview) they encapsulate. Then build the models of these notional systems based on considerations of root definition - a statement of PQR (do P by Q to help achieve R) as a transformation process, one where some entity is transformed into a different state. The model building puts together the activities needed to describe the transformation process; CATWOE - A transformation process (T) and a worldview (W) defines a purposeful activity and, will require actors (A) to do the activities which make up the transformation process, will affect people or customers (C) outside itself who are beneficiaries or victims, will take as a given various constraints from the environment (E) outside, such as a body of law or a finite budget, could be stopped or changed by some person/persons or owners (O) who can be regarded as owning it; 3E's – efficacy, efficiency and effectiveness. The models are then used to question the perceived real-world situation, structuring a debate about change. Accommodations meet criteria - systemically desirable and culturally feasible. An accommodation is a version of the situation which different people can nevertheless live with.

4.1. Sources of Data

Independent of the present study, and in a shared timeframe, The Department of Innovation, Industry, Climate Change, Science, Research and Tertiary Education (DIICCSRTE) co-funded, with UTAS, '*a consultancy that will develop a Project Scoping Document and Business Plan to progress the interests of stakeholders in the development of the food industry in Northern Tasmania'*. As part of this 'Consultancy' study a one-day stakeholder workshop was conducted, which included members of the Tasmanian agri-food industry, and representatives from UTAS, CSIRO and DSTO. This workshop was used to identify key stakeholders for the present SSM study. Additional information on stakeholder perspectives was gathered by the facilitator/analyst from: involvement with a preliminary CFI research project, sitting-in on some CFI 'Steering Group Meetings', and close involvement in the launch of the CFI. This access gave some insight into the 'worldviews' of the key stakeholders, and an early indication of some cultural differences between the collaborators. As the key stakeholders were geographically dispersed, the present study was conducted using a distributed workshop model (Morton et al., 2007). The facilitator/analyst drafted models (Franco and Montibeller, 2010) from each of the stakeholder perspectives, then held one-on-one interviews with key stakeholder representatives to get feedback and adjust the models as necessary.

4.2. Approach to Model Derivation

After initial engagement with the CFI, one of us (TKCH) prepared a mind map of the CFI stakeholder community (data not shown), and activity models for each of DSTO, UTAS, CSIRO and the Tasmanian agri-food industry, according to the SSM. A rich picture of the CFI environment was also sketched (data not shown). Development of the activity models took some time, as achieving a suitable balance of high-level and low-level detail is challenging for wicked problems. If not careful, the high level aspects can sometimes sound like little more than an organisation's vision/mission statement, while capturing low level aspects can run the risk of modeling real work activities. Checkland's guidelines (Checkland and Poulter, 2010) were used throughout model development, to help achieve balance.

For the one-on-one interviews, one representative each from the three research organisations, DSTO, UTAS and CSIRO were selected based on a combination of seniority within their respective organisation, engagement with the CFI, and availability. The industry representatives were identified from either the 'Consultancy' study or at the CFI launch. In addition to gaining feedback on the activity models, the one-on-one interviews were an exceptional way to get a deep understanding of perspective and position of the stakeholders.

The four activity models were then analysed to identify differences and overlaps in perspectives between stakeholders. A shared perspective or 'common' model was then developed to attempt to accommodate the key features of each of the four individual stakeholder models, with close consideration given to preserving the differences amongst stakeholders. This 'common' model could then be presented to decision makers to assist the development of CFI processes and procedures which capture the many stakeholders' perspectives.

5. MODELLING OF INDIVIDUAL STAKEHOLDERS

Activity models capturing the perspectives of each of four key CFI stakeholders were prepared using SSM. Feedback was sought from stakeholder representatives in one-on-one interviews. Commonalities and differences between the four models were identified, and a shared 'common' model developed.

Activity Model: DSTO perspective

Stepping through the SSM, from the DSTO perspective yields the results in Table 1, with stakeholder feedback sought from Chief Land Division. An activity model capturing the DSTO perspective was developed, Figure 1, and additions to the model from stakeholder feedback are shown in pink font.

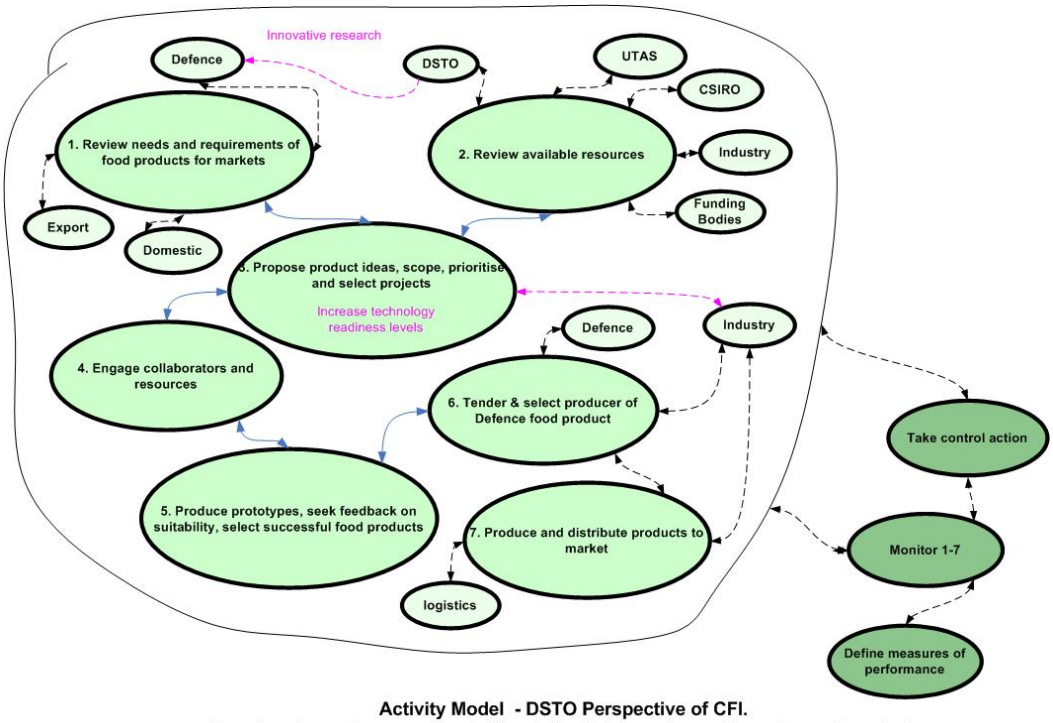

Figure 1 Activity Model of CFI – DSTO perspective

Table 1 SSM models – DSTO perspective with stakeholder feedback

Models	**Derived Model - Analyst**	**Updated Model - Stakeholder feedback**
P	Develop innovative food products	
Q	By collaborative research through CFI in process and product development	
R	To achieve desirable products with dual use in commercial and Defence markets	
Root Definition (RD)	Develop innovative food products by collaborative research through CFI to achieve desirable CRP products with dual use in commercial and Defence market which help increase the performance of ADF personnel	
C	ADF personnel, DMO, Tasmanian economy, regional towns with food processing business, UTAS Newnham campus, Dean SET, Pro VC, consumers who purchase products	
A	Research staff from food industry, DSTO, UTAS and CSIRO	
T	Collaborative food research through the CFI	
W	DSTO leads R&D in Defence feeding, DSTO assists industry to become better at supporting Defence capability needs, industry collaboration will be managed through the CFI, the CFI will create critical mass in a food research capability in Tasmania, DSTO Strategic Plan 2013-18 emphasises collaboration	DSTO drives innovation in Defence, seeds innovative ideas in Defence, drives requirements
O	DSTO executive, UTAS executive, DISSRTE, various industry and government funding bodies	
E	Food regulations (Defence, domestic and export), available resources including facilities, equipment, produce/ingredients, expertise,	
Activities – concerning the thing which gets transformed	Review needs and requirements of food products for Defence and commercial market including nutritional guidelines, product ideas, Defence requirement, market intelligence for domestic and export food markets, available products/ingredients	Increase technology readiness levels of products and processes
Activities – which do the transforming	Project scoping, project management (staff, funding, facilities, expertise) IP available or create, produce prototype, test prototype	Transition technology to industry
Activities – concerned with dealing with the transformed entity	Feedback on product, tender successful product, select producer, production, transport to market	

The activity model from the DSTO perspective flows well, with few feed-back loops. It also has one end point, and has 'products ideas, scope, prioritise and select projects, increase and technology readiness levels and transfer technology to industry' as transformation activities. Many CFI collaborators are mentioned, such

as DSTO, UTAS, CSIRO, Industry, and funding bodies. The end point is to produce and distribute products to market and Defence. R&D is not mentioned, but increasing technology readiness levels. The model is centred on assisting industry to meet Defence needs.

Activity Model: UTAS perspective

Stepping through the SSM, from the UTAS perspective yields the results in Table 2, with stakeholder feedback sought from Director CFI

Table 2 SSM models – UTAS perspective with stakeholder feedback

Models	**Derived Model - Analyst**	**Updated Model - Stakeholder feedback**
P	Up-skill food industry workforce	Increase innovation capacity
Q	By undertaking research and providing training	Through economic diversification
R	To help achieve an innovative Tasmanian food industry and contribute to global food security	food industry value add
Root Definition (RD)	To up-skill the food industry workforce by providing training and research to achieve an innovative Tasmanian food industry and to help achieve global food security	Up-skill industry workforce by increasing innovation capability to help achieve economic diversification and a viable industry
C	Food industry, and individual workforce members, regional areas, and local population	Add ADF members
A	UTAS teaching and research staff, DSTO research staff	
T	Workforce/students - Training/research/innovation – up-skilled workforce/viable food industry	Know how -technology transfer to industry-viable industry
W	R&D leads to a competitive viable industry, industry wants/needs a university trained workforce, UTAS changes people lives, UTAS puts leaders into the community	Plus economic development is led by technology transfer, UTAS wants to raise profile and research reputation
O	Dean SET, Pro VC, industry	Add deputy VC
E	University resources such as staff, facilities, students attracted to the new course, available funding, food regulations	Add red tape in food industry and trade restrictions
Activities – concerning the thing which gets transformed	Course preparation/development, advertising/attracting students, stipends, engagement of teaching/R&D staff, facilities and resources	
Activities – which do the transforming	R&D, training, undergrad/postgrad/industry workforce, industry challenge/research question	
Activities – concerned with dealing with the transformed entity	Publishing R&D papers, applying for patents, placement of up-skilled staff and students, graduation, technology transfer to industry, set up spin off companies	

An activity model to capture these responses was developed from the UTAS perspective of the CFI, Figure 2, and additions to the model from stakeholder feedback are shown in blue font).

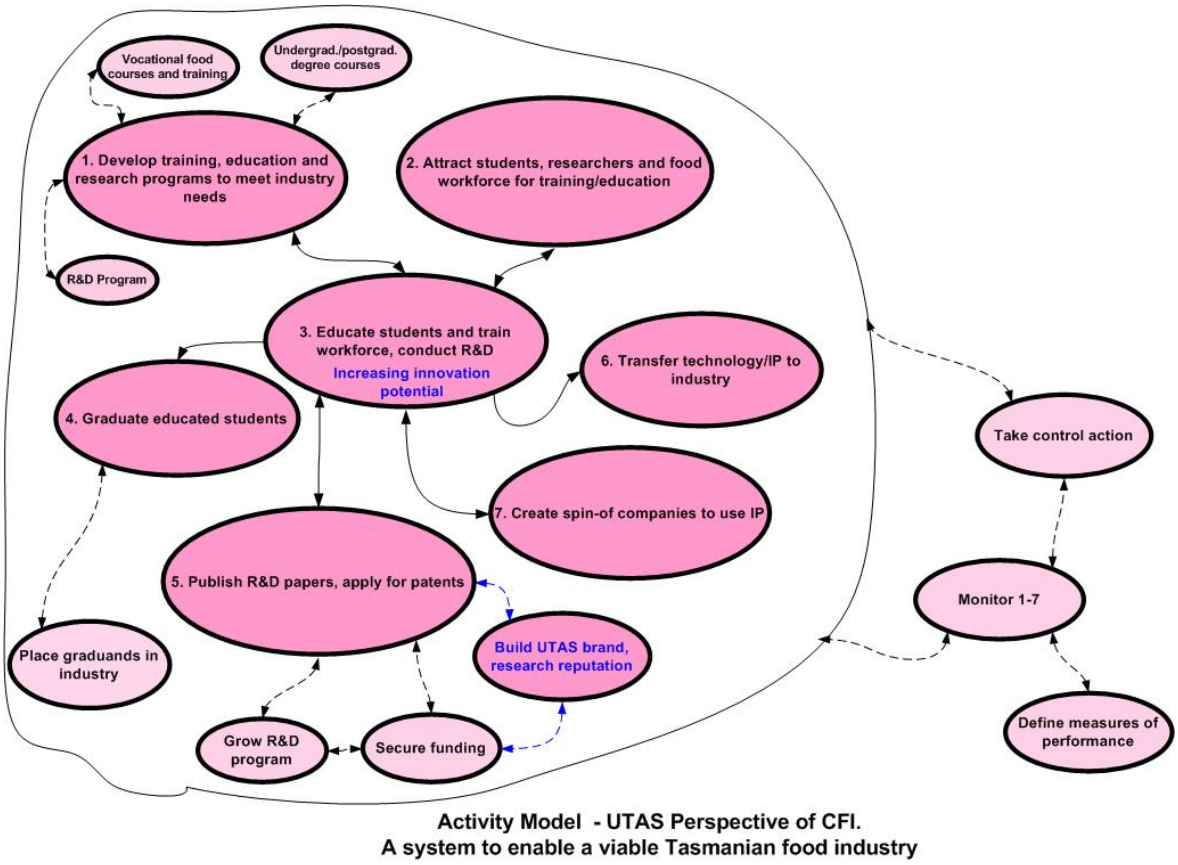

Figure 2 Activity Model of CFI – UTAS perspective

The activity map from UTAS perspective shows education and training as the key transformation process, and has many endpoints. The endpoints are graduate students, published R&D papers and applications for patents, transfer of technology to industry, and creation of spin-off companies. There is a feedback loop showing the publishing, funding, increase reputation, grow R&D connection. The collaborators are not explicitly mentioned. This is a UTAS system centred on skilling a workforce and conducting R&D.

Activity Model: CSIRO perspective

The results of the SSM from the CSIRO perspective are not shown in detail here due to space restrictions. Feedback was sought from Director of Innovative Processing, and although no changes to the activity model resulted, the feedback was very helpful in understanding the CSIRO Weltanschauungen.

In summary, the activity model from CSIRO's perspective has the central transformation process as conduct R&D, and has multiple end points, similar to UTAS such as report successful outcomes to industry, publish R&D papers and apply for patents. There are a couple of feedback loops with funding, publicising successful outcomes, and proposing new projects. The model mentions the 'agri-food industry', rather than 'industry' as in DSTO and UTAS. The key four collaborators are mentioned; DSTO, CSIRO, UTAS and industry. This is a system for R&D.

Activity Model: Industry Perspective

Stepping through the SSM, from the food industry perspective yields the result in Table 4. Stakeholder feedback was sought from Blue Hills Honey, Managing Director and Petuna Aquaculture, Food Technologist. Although the feedback didn't result in visible changes to the activity model, much information on business needs, goals and perspectives of the industry representatives were shared.

Table 3 SSM models – Industry perspective with stakeholder feedback

Models	**Derived Model - Analyst**	**Updated Model - Stakeholder feedback**
P	Successfully meet the needs of new and existing markets	
Q	By innovative product and process development	
R	To help achieve economic viability of the Tasmanian food industry	
Root Definition (RD)	To successfully meet the needs of new and existing food markets by innovative product and process development to help achieve economic viability of the Tasmanian food industry	
C	Rival businesses, regional community, local growers/farmers/consumers, business owner	
A	Production staff, CFI staff, Government employees (administers of funding and initiatives)	
T	Product development & innovative processing (through R&D development)	
W	Tasmania has clean, green primary products will have a competitive edge in the domestic and export markets. Value adding to primary products will diversify available markets, can be done viably in Tasmania, and will boost Tasmanian economy.	
O	CFI, company owners, Australian Government	
E	Price and availability of local products, food regulations for domestic/export/Defence markets, available investment resources, logistics for supply, market economics	
Activities – concerning the thing which gets transformed	Market intelligence, produce and process knowledge	
Activities – which do the transforming	Investigate/research prototypes through CFI	
Activities – concerned with dealing with the transformed entity	Invest in equipment, produce new products, distribute to market	

An activity model to capture these models is developed from the food industry perspective of the CFI, Figure 3.

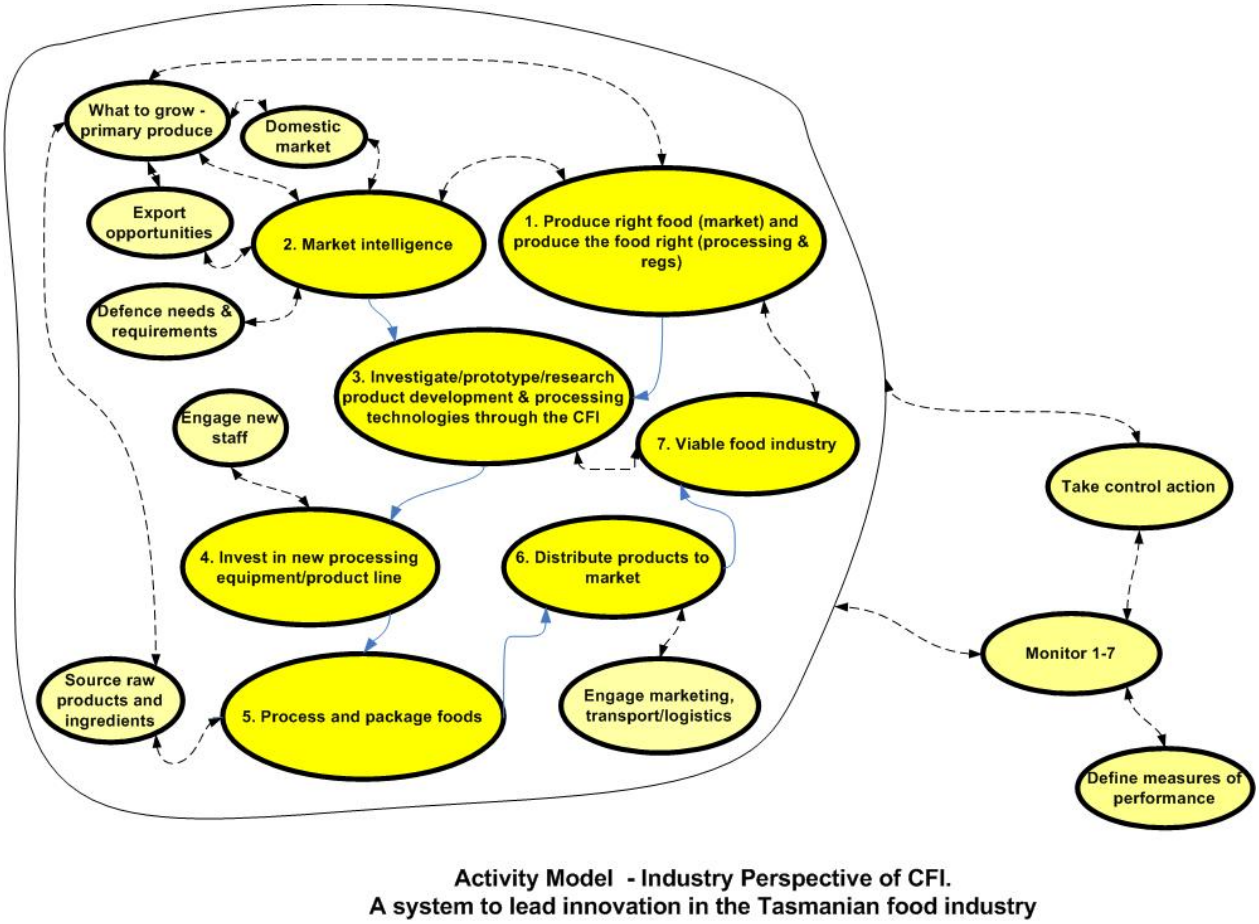

Figure 3 Activity Model of CFI – An industry perspective

The activity model from an industry perspective shows many feedback loops, with the endpoint being a viable food industry. This model doesn't mention collaborators, but does mention engaging staff (i.e. increasing employment) as an outcome of the central activity to investigate product development and processing technologies. One feedback loop also links in the primary producer in 'what to grow'.

6. THE WORKING MODEL – A SHARED PERSPECTIVE

The activity models from the four different perspectives investigated have significant overlap, but also show profound differences. The DSTO perspective shows producing innovative products for Defence, and key to this is to increase technology readiness levels to transfer to industry. The UTAS perspective is centered on educating and training industry staff and research students, with a by-product of building the UTAS brand. CSIRO is a system for industrial R&D. The Industry perspective is focused on creating a viable industry, through product development and novel processing technologies. The activity models indicate differences in perspectives. The SSM framework was again used in an effort to produce what might be a common model, Table 4, and to develop an accompanying activity map Figure 4.

Table 4 SSM models – Stakeholder Shared Perspective of CFI

Models	**Derived Model - Analyst**
P	Develop viable sustainable food industry
Q	By collaborative targeted R&D which increases innovation capacity
R	To help meet to meet both Defence feeding needs and opportunities in the new and existing commercial food markets
Root Definition (RD)	Assist the development of a viable sustainable food industry by increasing innovation capacity through collaborative R&D to enable Australian industry to take advantage of opportunities in new and existing markets, and to help meet Defence feeding needs
C	ADF personnel, DMO, Tasmanian economy, regional towns with food processing business, UTAS Newnham campus, Dean SET, Pro VC, consumers who purchase products
A	Research staff from food industry, DSTO, UTAS and CSIRO
T	Increase innovation capacity, raise TRL levels
W	The clean green Tasmanian food industry can be supported to increase innovation through CFI research and technology transfer. This will enable the industry to meet new and existing food markets and to help meet Defence feeding needs.
O	DSTO executive, UTAS executive, CSIRO executive, DISSRTE, various industry and government funding bodies
E	Food regulations (Defence, domestic and export), available resources including facilities, equipment, produce/ingredients, expertise,
Activities – concerning the thing which gets transformed	Review needs and requirements of food products for Defence and commercial market including nutritional guidelines, product ideas, Defence requirement, market intelligence for domestic and export food markets, available products/ingredients
Activities – which do the transforming	Project scoping, project management (staff, funding, facilities, expertise) IP available or create, produce prototype, test prototype. Research to increase technology readiness levels and develop prototypes for Defence and commercial food markets.
Activities – concerned with dealing with the transformed entity	Technology transfer, produce products, distribution to market, publications, patents, feedback from market, placement of trained people

Figure 4 Activity Model for CFI – Shared perspective

The activity model of a shared stakeholder perspective would, ideally, have a clearly-defined and agreed central activity, but could have many feedback loops. The model shown here mentions the key collaborators, and has multiple endpoints showing many feedback loops. Production of foods for Defence, domestic and export markets are key activities. The central activity, however, remains a complex mix of individual stakeholder aims and includes a diverse range of things such as knowledge creation, R&D of products processes and performance effects, training and education and raising TRL levels. The endpoints range from viable food industry, to production of foods, up-skilling workforce and knowledge dissemination. Increasing employment is specifically mentioned in a feedback loop.

The activity model proposed here for a shared perspective could now be discussed in a common workshop or presented to the Director CFI to increase understanding and for feedback. This model might provide the basis for interventions leading to further improvement of the complex system that is CFI.

7. DISCUSSION

SSM was used as a framework to explore perspectives and identify differences amongst a diverse range of stakeholders of a collaborative research centre - The Centre for Food Innovation. This approach provided insight and a wealth of specific information as to the many differences and varied goals and perspectives of those involved. SSM was well suited for this study, resulting in a proposed shared stakeholder perspective that could be used as a basis for further discussion and development of CFI business models and processes. Specifically, SSM assisted the identification of:

- The stakeholders' key goals and some potential issues which may effect the collaboration: the UTAS focus is on training and research, some delay will occur before outcomes are delivered to industry and Defence; CSIRO has a mandate to support industry, but industry want the 'close to market' support i.e. product development and analysis rather than R&D; DSTO's key interest is in supporting industry to meet Defence needs, but these needs may not overlap with opportunities emerging in the commercial markets, and Defence requirements in performance foods are yet to be articulated. Industry want innovation in order to remain viable in emerging markets.

- Activity models helped understand the dependencies within the CFI i.e. UTAS first needs to set up the degree program to take on research student and secure funding to build CFI facilities.
- One-on-one sessions assisted a deep understanding of stakeholders' perspective. There was a level of sharing insights that may not have occurred in a common session. Its also possible interviewees are more comfortable talking about complex business issues when in their own environment.
- Analysis 2 & 3 of SSM; observation on social and political analysis was very useful. It's very subjective and a bit 'gossip-like' so some aspects are difficult to document/share. It's also possible that something the analyst has observed and wishes to articulate, for improvement of the system, could be used as 'intelligence' or to gain power and control. So there is an ethical dimension.
- A distributed workshop worked well at the divergent stage of the process, but perhaps a common workshop is needed for the later convergent stage of formulated actions to change the situation.
- The analyst's knowledge and understanding of the invisible aspects of the CFI system grew rapidly when all key stakeholders were in the same room – the 'consultancy' workshop and the CFI launch day – there really is no substitute for a common stakeholder forum.
- Close study of Weltanschauungen (W) and transformation (T) is warranted. Although the stakeholders' Ws and Ts are not mutually exclusive, they provide a window into some of the 'invisibles' of the collaboration. Sharing 'invisibles' helps mutual understanding, and mitigates risks to success, as differences, in W and T in particular, may remain unexpressed if not studied.

In conclusion, SSM provided an excellent framework to explore perspectives and identify differences amongst the CFI stakeholders. An activity model was developed which provides an initial shared perspective or 'common' model for the key stakeholders. This 'common' model could then be used as the basis for a workshop to discuss goals and perspectives of the CFI, or used by key decision makers to establish CFI structure, processes and procedures which attempt to factor in this shared common vision. This would better position the CFI to establish organisational structures and processes that better enable a successful future.

REFERENCES

Ackermann, F. (2012). Problem structuring methods 'in the dock': arguing the case for soft OR. *European Journal of Operational Research*, 219, 652-658.

Ackoff, R. L. (1979). The future of operational research is past. *Journal of the Operational Research Society*, 30, 93-104.

Australian Government (2007) *Tackling Wicked Problems. A Public Policy Perspective*. APSC, Editor. Barton, ACT. Commonwealth of Australia: p. 38.

Australian Government (2012) *Australia in the Asian Century White Paper*. PM&C, Editor. Canberra: p. 320.

Bell, S. and S. Morse (2013). Rich pictures: a means to explore the 'sustainable mind'? *Sustainable Development*, 21, 30-47.

Berg, T. and R. Pooley (2013). Contemporary Inconography for Rich Picture Construction. *Systems Research and Behavioral Science*, 30, 31-42.

Checkland, P. and J. Poulter (2010) *Soft Systems Methodology*. In *Systems Approaches to Manageing Change: A Practical Guide*, Reynolds, M. and Holwell, S., Editors. London. Springer-Verlag: p. 191-242.

Curtis, N. J., P. J. Dortmans and J. Ciuk (2006). 'Doing the right problem' *versus* 'doing the problem right': problem structuring within a Land Force environment *Journal of the Operational Research Society*, 57, 1300-1312.

Franco, L. A. and G. Montibeller (2010). Facilitated modelling in operational research. *Journal of the Operational Research Society*, 205, 489-500.

Morton, A., F. Ackermann and V. Belton (2007). Problem structuring without workshops? Experiences with distributed interaction within a PSM process. *Journal of the Operational Research Society*, 58, 547-556.

NATO (2012) *NATO Guide for Judgement-Based Operational Analysis in Defence Decision Making - Analyst-Oriented Volume: Code of Best Practice for 'Soft' Operational Analysis*. RTO-TR-SAS-087, NATO

Rosenhead, J. (2006). Past, present and future of problem structuring methods. *Journal of the Operational Research Society*, 57, 759-765.

Rosenhead, J. and J. Mingers (eds.) (2009) *Rational Analysis for a Problematic World Revisited*. 2nd ed., Chichester, John Wiley & Sons Ltd.