

Title Page

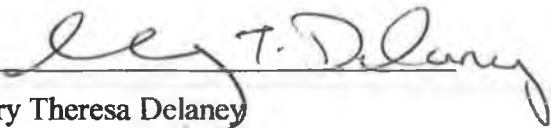
Innovation through Natural Resources

“A comparison of innovations used in natural resource companies along the West coast of Ireland”



This thesis is submitted in partial fulfilment of the requirements for achieving a Masters in Business Strategy and Innovation Management.

Signed:


Mary Theresa Delaney

Date Submitted: 01 September 2010

“The Wild and Wasteful Ocean”

William Shakespeare

(1569 – 1616)

Acknowledgements

In successful completion of this thesis I wish to thank the following people who contributed greatly in my completion of this thesis:

To my family and friends, most of them didn't know what I was doing but always supported me throughout the year

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And finally to the Masters Class of 2009/2010, thank you to the friends I've made and all the laughs had in making the Special Room so "special" throughout the year

Objectives

The following objectives have been developed in completion of the Thesis:

- **Identify innovative natural resource companies operating in the West of Ireland**
- **Review necessary literature available on topic of Innovation in the West coast of Ireland to identify gaps and develop research analysis**
- **Develop a Case Study for analysis on a company operating in the Western Region**
- **Compare innovations used through an Innovation Audit**

Scope

The research aims to understand the capabilities and limitations of innovation models and processes in natural resource companies in allowing the production of socially desirable innovation and the spill-over or knowledge transfer in the industry to be maximised in order to deepen understanding of innovation used. Research focuses on the Western Seaboard, where profile of companies were built through case study analysis and also innovation audit surveys were conducted through contacting natural resource companies along the west coast, where comparative analysis was undertaken to achieve industry relevant findings.

Basing research on the Western region accurately focuses on the hub of innovative natural resource companies operating in the west today and reflects the current economic climate in the increasing need to focus on our natural resources for growth and development of regions particularly in rural areas where it is increasingly becoming the main source of employment.

Limitations

As the researcher chose comparative analysis of three companies along the west coast of Ireland in order to develop quantitative research, this limited the scope of companies to be analysed, where only a small sample group could be examined, however, the author acknowledges the importance of this research to provide scope for future research in addressing gaps in the research and aid intellectual capital in the Western Seaboard. Since the research is not based on an all-Ireland basis taking into account other marine and natural resource companies along the North, South and East coast, the research only takes into account a fraction of the Irish industry and lacks examination comparative to international companies.

Gathering primary information may pose the greatest obstacle in answering my research question and completion of this Thesis. Obtaining accurate information that is clear will allow efficient analysis of data in providing a defined direction for interpreting data and making recommendations on my research, that adds to broader academic literature. Efficient time management is essential at all stages of the research and may be a limiting factor in gathering and analysing information from research. However, communicating regularly with my supervisor Larry Elwood in organising and directing my research should enable a direct focus on the thesis research question, allowing for the completion of the thesis for September.

The risk of not editing collected data and analysis correctly presents a risk to the thesis, where it is essential at all stages of research to ensure information constantly links back to the research question. Relevant data can be obtained through Galway Mayo Institute of Technology's library database and electronic resource in gaining Irish and International secondary data to provide academic justification and literature for the thesis.

The sample size of research also limits the scope of research, but is relevant to the Western Region in providing a profile of innovation in the region through the use of natural resources.

Executive Summary

Chapter one introduces the topic of the thesis in order to create a background for the thesis topic of innovation through natural resources and its application as being relevant and reflective of the current economic climate.

Chapter two provides a profile of the West of Ireland in providing the scope of research relating to Galway City, County and An Gaeltacht and Islands. The abundance of natural resources in the region is discussed in order to create increased knowledge and understanding of natural resources in the region with particular reference to the West of Ireland's seaweed resource.

Chapter three discusses and defines the topic of innovation as a fundamental topic guiding the thesis. The nature of innovation is very broad and affects all departments in business with the types of innovation from incremental to radical being discussed with its association with commercial success as a measure of successful innovation.

Chapter four analyses the available methods for conducting the research process. Elements of the research process are discussed with research methods examined in selecting the most suitable methods for conducting research being given. This chapter discusses the methods used by the author and the justification of using such methods.

Chapter five provides a case study on Rí na Mara in providing a contextual analysis of various areas of the business to be discussed. An overview is given on how innovation occurs in the business as it operates in the West of Ireland in Spiddal.

Chapter six compares findings from research under key areas of measurement used in the innovation audit. It was found that Cleggan Seaweed Company was operating well in all areas measured for innovation, which included Strategy, Processes, Organisation, Linkages and Learning. Rí na Mara is performing well innovatively in areas of Strategy and Organisation showing a well communicated innovation strategy and flexible organisational structure, however, the areas of Processes, Linkages and Learning were below average with recommendations given to the company as a measure to improve innovation.

Chapter seven discussed final conclusions drawn from research in completing the thesis and suggests that our natural resources are under utilised and an important resource for the West of Ireland and the Irish economy. Businesses are innovative in the West through technology, products and research and development, however following research much improvements can be made in areas of business and in industry in terms of knowledge transfer and linkages between businesses and stakeholders.

Abbreviations

B.I.M.	Board Iascaigh Mara
B.M.W.	Boarder Midlands and Western
C.E.O.	Chief Executive Officer
C.I.P.D.	Chartered Institute of Personnel Development
D.A.F.F.	Department of Agriculture, Fisheries and Food
D.C.U.	Dublin City University
D.r.	Doctor
G.C.C.	Galway County Council
G.M.I.T.	Galway Mayo Institute of Technology
I.B.M.	International Business Machines
I.C.T.	Information and Communications Technology
I.D.A	Industrial Development Agency
Jnr	Junior
Ltd	Limited
N.U.I.G	National University of Ireland Galway
N.C.S.R.	National Centre for Sensor Research
S.M.E	Small Medium Enterprise
St.	Saint
T.D.	Teachta Dála
U.C.H.G.	University College Hospital Galway
U.K.	United Kingdom
U.S.	United States
W.D.C.	Western Development Commission

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Chapter One

Introduction

1.1 Introduction

The initial chapter of the thesis introduces the topic of innovation as a current topic that is widely discussed and published in media reflecting the reaction to the current economic climate. The preparation and backdrop of the thesis focuses on selecting innovation in the West of Ireland and displays the author's interest in the topic in being a relevant topic to be applied to the current climate. A brief description of the author is discussed before the structure of the thesis is exposed offering a summarised guide to the layout and framework of the development of research.

1.2 About the Author

Native to the West of Ireland from East Galway, the author has grown up surrounded by natural resources from a farming background growing natural produce with a healthy and active lifestyle in the country. Nowadays the author is far removed from youth in the country where reliance on supermarkets and technology is a customary part of every day life. Natural organic produce was customary growing up, which was often taken for granted as today the author resorts to failed attempts of horticulture trying to grow parsley in pots. The author's mother is native to the Connemara region, where the author spent summer holidays with her sisters making many trips made to the region throughout the year. Eating Carrageen for dessert was customary but was often grimaced by school friends at the thought of eating seaweed when explained to classmates after the holidays, where the region and relatives were always a source for fresh fish and scallops that were always free, not realising the delicacy of the mollusc we were eating.

The decision to undertake doing a thesis based on the area of natural resources in the West of Ireland evolved following the visit by the author to yet another farmers market selling a wide variety of fresh, locally sourced produce. The past two years has seen a rise in the number of farmers markets showcasing small businesses and natural products throughout the entire of Ireland following the recession.

Undertaking research on farmers markets had interested the author, however the decision to undertake research on the utilisation of natural resources through innovation proved of greater interest to the author.

Our surroundings and natural resources are often taken for granted and therefore are left under-utilised. Examining companies and institutions that utilise natural marine resources provided a challenge for the author to delve into the much researched area of innovation but also provided a greater opportunity to explore literature and undertake research in an area of business and sector of the economy that is researched by marine institutions.

1.3 Background to Research

The author's decision in selection of topic and issues to be examined in order to complete the Thesis was chosen in reflection of the current economic climate and the precedence to remain innovative in business and society. Our natural resources as a source of revenue and long-term growth for the future focuses on the Western Seaboard and innovative models used in order to generate revenues and provide incomes for the future.

The subject of innovation is a regular topic in media articles, industry reports and even in college courses as was a predominant topic in the author's own course Masters in Business Strategy and Innovation Management; with innovation currently published and reviewed more than ever, highlighting its importance as a prevalent topic in Ireland and globally. The researcher's interest in exploring the topic of innovation specifically in maritime based natural resource companies along the Western Seaboard, provides the basis for focusing research within the scope of this issue of innovation and along the west coast of Ireland as a chosen location. As the author is native to the West of Ireland, completion of the thesis is reflective of the importance of being innovative at home, using available resources and developing them to generate revenues as a true measure of innovation.

The decision to undertake research in the area of natural resources and in particular our Irish resource of seaweed arose from the announcement in October 2009 of a

recent boom in seaweed harvesting in Connemara resulting in a self imposed ban on supply with the Arramara factory in Cill Chiaráin giving notice to suppliers of not accepting deliveries at the beginning of November for two weeks of seaweed harvested produce.

Lack of support for this resource could result in the closure of the Irish operations, as a drastic measure, with loss of revenue for rural areas where this organic resource is a main source of income for the community. As many local residents have turned to this natural resource as a source of employment following lay offs in the construction industry, it is essential to maintain the development of this natural resource as a long term objective (Arramara Teo., 2009).

Examining innovative methods in the marine industry that support the promotion and development of natural resource products in Ireland and Internationally may enable findings of research to offer recommendations and academic literature that highlights the importance of Ireland's natural resources and its need to be recognised and utilised as a source of innovative revenues, offering further new and unique Irish natural resource products with opportunities for long term development and revenues.

Recent demand for *Chondrus crispus* or Carrageen Moss is high reflecting the expanding domestic and international markets for health food as well as its increasing use in biotechnology. In 2001, sales enquiries for a massive 700 tonnes of Carrageen Moss (worth €2 million) were received by Irish companies. Unfortunately, most of these sales opportunities were lost due to insufficient supply. Against this background of strong demand, an increase in production would be absorbed by expanding markets. However, with numbers of seaweed pickers actually dropping lower harvests are forecast. The profile of the Western Region will be examined to develop a profile of the region and highlight the abundance of natural resource with reference to the natural seaweed resource that grown in vast quantities along the West Coast of Ireland.

This research is vital in this current climate, where utilising our natural resources and investment into operations, processes, research and development offer increased sustainability of natural resource products for the future, in particular with reference to the West Coast of Ireland. The resource of seaweed is used in many industries in Ireland such as food, cosmetic, horticulture and farming and is increasingly expanding to international markets, where demand for organic products and consumers in seaweed's supply markets seeking healthier lifestyles.

The research undertaken takes into account various methods to be used in the development of the thesis with relevant methods and techniques discussed in order to select appropriate methods that are relevant to research. The examination and development on literature of the research process guides the researcher in preliminary research measures to data collection methods and analysis and interpretation of information before final findings and recommendations on the research are given.

1.4 Structure of the Thesis

Chapter one introduces the topic of the thesis in order to create a background for the thesis topic of innovation through natural resources and its application as being relevant and reflective of the current economic climate.

Chapter two provides a profile of the West of Ireland in providing the scope of research relating to Galway City, County and An Gaeltacht and Islands. The abundance of natural resources in the region is discussed in order to create increased knowledge and understanding of natural resources in the region with particular reference to the West of Ireland's seaweed resource.

Chapter three discusses and defines the topic of innovation as a fundamental topic guiding the thesis. The nature of innovation is very broad and affects all departments in business with the types of innovation from incremental to radical being discussed with its association with commercial success as a measure of successful innovation.

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1.5 Conclusion

The introduction of the author and background to research provides a framework for the decision to undertake the topic of Innovation through natural resources, focusing on the West coast of Ireland with particular interest in natural marine resources. This chapter focuses the research and guides the literature review as discussed in the following two chapters. A profile of the Western Region is developed in the following chapter with the topic of Innovation discussed and defined in chapter three.

Chapter Two

Profile of the Western Seaboard

2.1 Introduction

The previous chapter introduced the author and the background to the research as a foundation of topics to be discussed and the decision in selecting “Innovation in natural resources”. Choosing the Western Region as a scope and foundation of research offers a profile of the region with an abundance of natural resources on its doorstep, which is a source to be utilised for the sustainable development of the economy. The effects of the economic downturn is prevalent still throughout Ireland and throughout the Western Region with an increase in publications on the region in an attempt to aid authorities such as the County Council in developing a regeneration and sustainable strategy for the region.

The aquaculture industry in the West is under developed and provides a viable source of income and advancement of Galway City and County and surrounding regions for the future. Through analysis of natural marine resources available along the West Coast of Ireland, their locations and benefits to their localities will be indicated with a profile developed of natural seaweed resources available along the Western Region. Development of Galway City and County and rural regions such as An Gaeltacht are confronted with an opportunity to recognise and utilise our natural marine resources for future generations through enhanced understanding of the region and its natural offerings leading to sustainable development for the future.

2.2 The Western Seaboard

In order to introduce the topic of research the author offers a profile of the Western region in relation to seaboard counties included in the scope of the research. The counties include Mayo, Galway, and Roscommon in order to focus research on the specific segment of the Western Seaboard as a provision to answer the research question. As an introduction to the Western Seaboard, agencies charged with the promotion of social and economic development in the western region and the sustainability of industries in the region have stated important traits and characteristics of this region as offering a rich standard of life, a valued and protected heritage that is unique to the Western Seaboard and a region that is ambitious and confident where innovation, excellence and creativity are rewarded (Western Development Commission, 2010).

It is in the vast natural resource of the Irish coastline, that the provisions for future growth are continually emerging in industries located along the Western Seaboard. The area of aquaculture in this sector provides a major source of employment and development of economic activities in coastal areas, where in the past sources of revenues lay in the Western landscapes and culture resulting in incomes for the local regions being derived from tourism (National Tourism Conference, 2009).

The aquaculture industry's contribution in Ireland is economically vital for Ireland's development of the environmental and economic sustainability of coastline communities where this income is the main source of revenue sustaining the locality (DAFF, 2010).

2.3 Profile of the Western Seaboard

In discussing the Western Seaboard, the population of the Region is stated in order to develop the profile of the sector, with location of the region reviewed in order highlight the indigenous resources of the region (see Appendix 2 for map).

The Western region includes the counties Galway and Mayo with a total population according to 2006 Census of approximately 355,509. Principle towns in the west include Ballinasloe, Tuam, Ballina, Castlebar, Westport and Galway city a major urban region with breakdown of population as follows:

Table 2.1 Population of the Western Region

Galway City	72,414
Tuam	6,885
Ballinasloe	6,158
Castlebar	11,891
Ballina	10,409
Westport	5,475

(IDA, 2010, Retrieved: 22/02/2010, p. <http://www.idaireland.com/locations/regions-of-ireland/west/>)

In order to focus the literature, the secondary review of data examines Galway City and County in order to develop further research on the Locality. The West is highly recognised and regarded for the quality of life it offers where the Region is associated with its charming landscape and coastline and picturesque scenery. County Galway's location along the Western Economic Corridor is at a central hub of the Region and being Ireland's second largest county after Cork at 6,149km² with a coastline that encompasses almost 2,000km.

Along with its extraordinary landscape, Galway's culture and Irish language establish the county's unique cultural distinctiveness with the Region containing the largest of Ireland's Gaeltacht population at 37% of national Gaeltacht populations. County Galway has seen rapid development, like the rest of the country, in the nature of employment, where the origin of employment has altered noticeably since 1986 when agriculture accounted for 35% of employment in the Region; approaching 2002 this figure had decreased to 11.2% with the vast sources of employment in Galway coming from manufacturing, professional services, commerce and other industries including tourism serving as an important industry to the economy in both the city and the county (Galway County Council, 2010).

Strong indigenous clusters of enterprise development in Galway City and County exist in the sectors of pharmaceuticals, software development, biomedical engineering and electronics with industrial development having a tendency to assemble around the City, where industries in the County are generally in agriculture, fishing, manufacturing, forestry and tourism (Galway County Council, 2010). Figures from the live register reveal the largest increase of individuals signing on was from the craft industry. Due to the current economic climate figures from the live register reveal an increase in males and females across Ireland and in the West signing on the live register as shown in the table below:

Table 2.2 Live Register Figures for the West

	July 2009	June 2010	July 2010
Males	26,228	27,138	27,636
Females	14,774	14,740	15,856
Total	41,062	41,878	43,492

(C.S.O., 2010, Retrieved: 13/08/2010,

[p.http://www.cso.ie/releasespublications/documents/labour_market/current/lreg.pdf](http://www.cso.ie/releasespublications/documents/labour_market/current/lreg.pdf))

With the economic downturn unemployment figures are still increasing and it is precedent more than ever to utilise our natural resources in the West in a bid to be innovative and encourage economic development.

Galway City is increasingly progressing as a platform for innovation and economic development in the region that is communicated and replicated throughout the Region and County. Engineers Ireland West, as part of their submission to the overall draft Development Plan 2011-2017 recommended the plan should incorporate a distinct vision for the City of Galway by 2023, where appropriate strategies are set out in realising that vision. It is recognised that the foremost indigenous assets the City holds are in its culture and people, heritage and in its environment comprising of the international recognition and reputations of Galway Bay and Connemara consolidating a substantial area that is An Gaeltacht. The Western Region's environment further includes an immense section of Ireland's 220 million acres of seabed terrain (Engineers Ireland West Region, 2010), which is a base for a growing number of aquaculture industries predominately located in remote areas along the Western Seaboard. The aquaculture industry is a major new source of employment and creator of economic activities in coastal areas due to the proximity to the resource and the availability of labour force with few alternative employment opportunities due to the current economic climate (Marine Institute, 2010).

The West Regional Authority identified a collection of sectors in the Western Region that had not reached their full developmental ability with potential for further growth, which included water-based industries, sporting and recreational facilities, domestic and sectoral tourism and indigenous based industries. They also highlighted more necessarily marine based industry and marine biology as industries to be promoted for sustainable development (Galway County Council, 2010). In Galway County Council's report for an Economic Development Strategy, a quote from the Western Regional Authority significantly addresses the importance of the marine sector in the West of Ireland stating,

“The aquaculture sector in the West Region has grown significantly in the last decade. Production is concentrated along the Western Seaboard. Fishing, fish processing, transport, aquaculture and related activities generate significant employment and are sectors that are likely to experience considerable growth and contribute greatly to the economy of rural areas in the future. There is a need to develop fishery harbour infrastructure and aquaculture activities beyond primary production as well as developing fisher coastal and harbour facilities to reduce the isolation of island communities.” (G.C.C., 2010).

The rural areas of the Western aquaculture industry are predominately located in An Gaeltacht, as part of economic development the Gaeltacht and Islands are two zones being supported for development by the County Spatial Strategy as part of the Economic Development Strategy in order to stimulate cultural, economic and social development. Irish Agency Udaras na Gaeltachta is engaged in driving economic growth in the Islands and Gaeltacht Regions, where specific development strategies for this region are being developed in Community, Enterprise and Economic Development. As part of Council initiatives to invigorate economic growth in these zones, the focus on marine enterprises in this precinct offers enormous growth potential to the region in terms of long-term sustainability of the marine industry and prolonged employment for the future, where in extension to the growth of these areas the added value cultural resources of the Region, is recognised in the further potential development it adds to the local Gaeltacht and Island economies. Measures for the areas from the Council are as follows giving a broad gauge of successful indicators:

- Maintained diversification of the County Galway Economy
- Value added products and services to be developed
- Development of town and farmers markets throughout the county
- Increased promotion and harnessing of the county’s natural resources to include: marine based resources, language based products, alternative energy resources, agriculture, cultural resources and Gaeltacht area

(G.C.C., 2010)

The natural resources in the West of Ireland are a key aspect for overall economic development in the Region in supporting the growth of our indigenous assets. Current industries should be sustained and supported as models for the establishment of marine based industry clusters and renewable energies in Galway, in areas of wind and wave energy, agriculture, tourism, fishing, sailing, seaweed and food and medicinal products.

“The vision for the City should include a Centre of Excellence in Marine Research and Development” (Engineers Ireland West Region, 2010, p. 10 & 11) such as the Marine Institute providing strategies for growth in the Region, across Ireland and marine resources worldwide.

Based in Galway the Marine Institute facilitates much development of marine resources in the Region and across Ireland, providing the West with a robust platform for the development of the Western Region as a hub for maritime activities that benefit the economy.

2.4 Marine Activities in the Western Region

“The ocean comprises 71% of the earth’s surface and is an integral part of every aspect of human life. Throughout history, the ocean has connected our world – through exploration and scientific enquiry, immigration and acculturation, trade and the exploitation of maritime resources” (World Ocean Observatory, 2010, Retrieved: 24/06/2010, <http://www.thew2o.net/content/physical-ocean>).

The Global ocean economy is worth an estimated €4,363 billion with revenues generated from the following sectors:

Table 2.3 The Global Ocean Economy

	<u>€'Billions</u>
Global Economy	4,363
Shipping and Transport	1,437
Maritime Tourism	928
Off Shore Oil and Gas	476
Sea Food Processing	384
Marine Equipment	358
Fishing	249
Ship Building	155
Ports	136
Marine Aquaculture	134
Cruise Industry	67
Research & Development	54
Seaweed	33
Marine Commerce & IT	45
Minerals & Aggregates	15
Renewable Energy	13
Marine Biotechnology	12
Submarine Telecoms	12
Ocean Survey	10
Education & Training	8

(O’Sullivan, 2009, Slide9)

As an island nation, Ireland has a strong tradition of innovation and marine science that has contributed greatly to knowledge transfer and growth in marine development. Marine research in Ireland is comprised of a host of a variety of bodies of the marine science community that include: Institutes of Technology, such as G.M.I.T., Universities, Commercial Companies, State and Semi-State bodies and also organisations and individuals who work continuously to enhance sustainable development of our marine resource (Marine Institute, 2010). Ireland's ocean economy contributes €3 billion annually to the Irish economy with earnings generated from marine services, marine resources and marine manufacturing as follows:

Table 2.4 Irelands Marine Sector

	<u>€Millions</u>
Marine Services	2,028
Shipping and Transport	1,275
Water Based Tourism	566
International Cruise	66
Other Marine Services	121
Marine Resources	6,885
Fish Processing	366
Fish Landing	210
Aquaculture	117
Oil Exploration	22
Gas Production	115
Off Shore Renewable Energy	18
Seaweed	9
Marine Manufacturing	6,158
Marine Technology	69
Boat Building	20
Other Marine Manufacturing	27

(O'Sullivan, 2009, Slide 8)

Ireland's Marine Resources account for the largest revenues above manufacturing and services with seven sources of revenues, from fish processing yielding the highest revenues to seaweed with a €9million contribution to the economy. However, in comparison to global figures, Ireland shows no contribution from Research and Development that contributes €54 billion worldwide. It is important to recognise the areas in Ireland's marine sector that are performing well and develop and sustain development in other existing areas of revenue and potential sectors in aquaculture. According to O' Sullivan, 2009, Slide 7 " Ireland is 90% undiscovered, undeveloped and underwater", showing the vast potential for growth in this sector.

The Marine Institute in Galway has undertaken much discovery and research in the development of a Marine Knowledge, Research and Innovation Strategy for Ireland called Sea Change 2007-2013.

2.5 Sea Change – A Marine Knowledge, Research and Innovation Strategy for Ireland 2007-2013

The Irish Government in 2007 announced the adoption a strategy to enable the development of marine resources in Ireland that develops and sustains the knowledge economy in this sector. The opportunities to enhance and exploit Ireland's extensive marine resources by developing niche areas through technological and scientific effort. Although Ireland's current share of the Global marine economy is diminutive, the contingency exists to develop Ireland's marine sub-sectors in areas of fishing, seaweed, shipping, aquaculture and tourism with an internationally traded or high export potential with returns of revenues and sustainability for the future for these coastline regions. The main objectives of Sea Change 2007-2013 encompass are:

- To revitalise, grow and sustain existing marine sectors
- Encourage a ploy from traditional low-value products and services to internationally traded and knowledge intensive ones
- Advancement of new industries and new opportunities
- Enhance and protect our marine environment

(Marine Institute, 2010)



Sea Change identified the research needs in a number of potential areas in order to increase knowledge generation and research capacity undertaking four research measures as part of the research programme:

Table 2.5 Sea Change Research Measures

Industry	Fisheries Resource Aquaculture Seafood Processing Seaweed Shipping Offshore Oil and Gas
Discovery	Marine Technology Biodiscovery/Biotechnology Renewable Ocean Energy Marine Functional Foods
Policy Support	Marine Environment/Ecosystems Marine Climate Change Knowledge and Information Management Socio-Economic and Legal Research
Infrastructure	Seabed Resource Mapping Research Vessel – Ship time Research Infrastructure
Innovation	Networking

The Marine Institute has been funding research since 1994 where funding of €100 million was allocated to research between 2007 and 2008. Industry received €28.8 million, discovery was allocated €29.8 million, €19.8 million for Policy Support and Infrastructure received €21.7 million in funding.

Each measure of research is a key element to the delivery of Sea Change in realising the full potential of the Irish Marine Industry. Focusing on Industry that host active participation from stakeholders in the public and private sector is just one sub-division of the overall research measures in securing industry participation in the marine strategy (O'Sullivan, 2009).

Engaging public and private stakeholders in industry is essential to exploit collaborative opportunities to create a pool of expertise, experience and funding and to promote competencies that support and benefit industry and develop new and existing research capabilities. Since Sea Change has been introduced to industry achievements through significant formal and informal interactions have occurred in fisheries, aquaculture, seafood and seaweed, where approximately €7 million worth of funding has been invested.

Fisheries Resources

Rebuilding fish stocks through substantial stakeholder participation and reliable marine science has been enhanced through direct industry participation in research projects, through the partnering of N.U.I.G. with B.I.M. and the Federation of Irish Fishermen. This project involved retaining and capturing knowledge in the fishing industry for use in fisheries management, advisory and scientific assessment, where the improvement of knowledge transfer and retaining can be achieved through collaboration and communication of local fishers with traditional knowledge. This has been further aided through the Irish Fisheries Science Research Partnership, which provides a platform allowing fisheries scientists and fishermen to work collectively towards sustaining the industry and rebuilding fish stocks. An additional project that incorporates inputs from stakeholders has achieved durable links through the Beaufort Ecosystem Approach to Fisheries Management.

Aquaculture

A number of challenges face the finfish aquaculture industry in Ireland where mortalities caused by diseases cause huge losses in profitability highlighting the need to diversify into new species. The Marine Institute along with industry developed research plans to address challenges through AquaPlan and Gill Pathologies that have developed scientifically proven measures in the mitigation and government of infectious diseases, while developing an extensive strategy with emphasis on preventative measures, reporting, training and early warning measures. A cod broodstock programme was established to support the cod farming industry through partnerships between N.U.I.G., B.I.M., the Irish Seafood Producers Group, U.C.C. and Trosce Teo, where €4.1 million has been designated to the programme over a 7 year period.

Seaweed

As part of a workshop organised to explore gaps in knowledge to prioritise research needs, Enterprise Ireland along with B.I.M., Udaras na Gaeltachta and 15 Irish Seaweed firms, each submitted research plans in an attempt to address identified needs of the industry. The need to develop further knowledge on seaweed species, processing and the various extraction methods was proposed with further research in the areas of chemical and biochemical analysis needing to be addressed (Marine Institute, 2008, p. 12-15).

The collaboration the marine institute have developed with industries has created a greater consensus in knowledge transfer and improved understanding among sectors for overall sustainable growth of the industry and economic regeneration in Galway City and County and throughout the marine sector in Ireland. In an attempt to understand the abundance of natural resources sustaining the Galway region and currently underdeveloped components of industry, an examination of seaweed resources off the West Coast of Ireland will be discussed with reference to the Connemara region.

2.6 Assessment of Seaweed Resources of *Ascophyllum* and Kelp off the West Coast of Ireland

The majority of seaweed harvesting in Ireland is situated in County Galway where the largest seaweed processing plant in the country is located. Seaweed zones in along the Galway coastline are some of the most copious areas in Ireland for further seaweed potential and utilisation. Conditions along the Galway and Connemara coast are highly conducive to seaweed growth. County Galway has the highest growth of *Ascophyllum Nodosum* (Bladder Wrack) than any other county in Ireland. Through examination of various harbours and bays along the West Coastline, the abundance of the resource can be accounted in identifying the Galway Region as the number one locality for seaweed production and utilisation of this natural resource.

Killary Harbour

From the mouth of Killary Harbour along the coast to Tonakeera Point a medium supply of mixed kelp is available with higher supplies of the resource along the coast but becomes patchy with less beds towards Dawrosmore, where Ballynakill Harbour was recorded in 1996 as supplying 500 t of seaweed being cut by two harvesters. The area stretches for 3 km with a recorded bed depth of 10 metres with an abundance of mixed kelp available on the southern shore of Ballynakill Harbour. Streamstown Bay offers a high quality of *Ascophyllum* offering the potential of 1000t per annum with Kingstown Bay offering 500t per annum. Both Bays have a four-year regeneration cycle with further attractions of the region in its ease of accessibility with a pier

Mannin Bay to Bertraghboy Bay

From Mannin Bay to Slyne Head no significant resources have been recorded, however a significant amount of the resource stretches along Ballyconneely Bay for approximately 15km. Growth cycle of the resource is every four years in this area making the utilisation of the resource in this area highly lucrative with approximately 2,000 t for potential harvest per year. From Ballyconneely Bay to Rosaveel a three-year regrowth period is estimated for the area. Up to ten cutters are listed for the area between seasonal and winter cutters to utilise the harvesting potential in the area.

Cashel Bay to Mweenish Bay

An inlet north of Bertraghboy Bay covers 7 km with the potential to produce 2,000 t of biomass annually, where in 1996 only 400 t was harvested. Kelp beds are plentiful in Bertraghboy Bay but are not as dense as Moyrus Bay where also good quality *Ascophyllum* grows. The total harvest potential of the area is up to 4,000 t, which is easily accessible from the pier. Mweenish Island also is source to high quality *Ascophyllum* and is located near Carna, which is renowned for a large number of harvesters in the area.

Kilkieran Bay

The largest seaweed processing factory in Ireland is located in Kilkieran Bay, where Arramara Teoranta is the main purchaser of *Ascophyllum* in Connemara employing up to 120 harvesters in the region. A number of islands located in the area offer good quality *Ascophyllum* with the potential of offering 2,675 t annually. Road access and landing piers are considered good in the area with many of the islands such as Lettermore and Lettermullan linked with roads where much of the resource flourishes. Kelp resources are also present off Kilkieran Bay and Carraroe with vast supplies off Lettermullan also.

Spiddal

Access from Cashla Bay to Rosaveel is considered good with a local pier where sufficient quantities of kelp is present but becomes more sparse as the coastline approaches Spiddal, but is more replenished the Furbo side of Spiddal. Closer to Galway Bay, resources of *Ascophyllum* decline, due to the muddy and soft shore. As the coast stretches towards Kinvarra Bay and Auginish Head, access to the resource is good with piers and good roads in the area with kelp beds also found in the area.

Aran Islands

The Aran Islands have recorded a high abundance of mixed kelp on the eastern side of the islands with no recordings of *Ascophyllum*.

(Hession et al, 1998)

The areas identified along the western coastline, highlights the abundance of natural seaweed resources that regenerate with high levels of quality. Although the potential harvesting ability of some areas has not been fully realised, the potential to utilise the resource still exists. Through commercial and government investment the potential of the seaweed resource in Galway can be utilised. Using current practices and procedures with new and innovative techniques will enable growth in the industry and create revenues in many of these coastal regions. In order to discuss innovation in our natural resources the much publicised and current topic of innovation will be discussed.

2.7 Conclusion

The economic downturn currently still affecting many regions throughout Ireland is causing many businesses, institutions and bodies to question what they are currently doing and look to their current environment and the amenities available. The abundance of natural marine resources along the Western Region surround Galway City and County and is yet to be fully utilised as recommended by Galway County Council and Engineers Ireland West. Natural marine resources available in vast quantities along the West coast of Ireland and Gaeltacht regions, promotes opportunities for success in recognising the need to utilise our natural resources, as an initiation towards bolstering rural economies and the Galway locality.

The gateway of natural marine resources is underemployed and will continue as such, if this natural asset is not promoted as a commercial resource. To avail of the accessible opportunities promoted by natural resources, the following chapter discusses innovation as an additional resource to any business, in elevating new or old opportunities toward commercial success through types of innovations used in business. Integrating innovation into the culture and sustaining the business will be discussed in order to examine innovations used in natural resource companies operating in the West of Ireland.

Chapter Three

Innovation

3.1 Introduction

Chapter two introduced a profile of the Western Region as a boundary to the focus of research. Literature sourced on the West Coast of Ireland provides the basis in discussing natural resources available in abundance along the Region and highlights the quality and viability of the resource in Galway. The City and County, not unlike the rest of Ireland have felt the impact of the economic downturn, where the impetus to develop our industries and sustain development of our regions is a currently promoted.

The previous chapter recognised the expanse of our natural resource with a brief assessment of seaweed resource, this chapter seeks to define innovation and the measures of innovation that have enabled businesses to take advantage of opportunities. The underlying topic or theme of the research involves “Innovation in Natural Resources” and provides scope for research through investigation of the topic of innovation in understanding the role innovation plays in business.

Through examination of the types of innovation, this chapter will then discuss innovations currently used in natural resource companies with examples of companies discussed to highlight the models of innovations used by marine and natural resource companies in Ireland.

3.2 Innovation Defined

There are several different definitions of innovation with many used in recent publications as a reflex reaction to the current economic climate, towards a measure of increasing business activities and improving prosperity and sustainability in organisations for the future. A simple definition is difficult to find due to the diverse nature of business and the differing aspects of innovation, however it is important for businesses themselves to have a clear understanding of the innovation that is established and characterises their organisation in order to implement innovation throughout the company.

Although the author's literature review of secondary data available, sought the most current and relevant resources available, the researcher felt the use of the acclaimed father of innovation, Joseph Schumpeter's understanding of innovation remains relevant today as it did over 70 years ago, where he introduced five different dimensions of innovation:

- Introducing a new product or an improved version
- Different of new methods of production introduced to a business
- Creation of new markets
- New sources of supply
- New competition causing the restructuring of an industry

(Goffin and Mitchell, 2005)

Michael Porter raised similar points to Schumpeter, where they both use the word "new" in their definitions, however looking at innovation in an organisational context, Porter suggests innovation can develop from a company's learning and not just from the research and development fraction of the business, where he defined innovation:

"to include both improvements in technology and better methods or ways of doing things. It can be manifested in product changes, process changes, new approaches to marketing, new forms of distribution and new concepts of scope...(innovation) results as much from organisational learning as from formal R&D."

(Goffin and Mitchell, 2005, p. 8)

Common attributes can be identified by comparing various definitions, where innovation is not just about offering something new but offering new ways of improving mature industries or long established businesses. Tidd and Bessant, 2009, p. 3 stated, "Innovation is driven by the ability to see connections, to spot opportunities and to take advantage of them". It is more than something new and using it, innovation's success can be measured by how successful the outcomes of innovation are.

The Irish report on the Innovation Taskforce launched by An Taoiseach Mr Brian Cowen T.D. as a measure to combat the economic downturn and restore the economy to sustainable economic development. The Innovation Taskforce offered their determination of innovation as "investment aimed at producing new knowledge and using it in various applications. It results from the interaction of a range of complementary assets, which include research and development, but also software, human capital, design, marketing and new organisational structures – many of which are essential for reaping the productivity gains and efficiencies from new technologies." (Innovation Taskforce, 2010,p. 2)

Although the innovation taskforce recognised the broad concept of innovation, the definition is given to focus the concept of innovation for the taskforce and provide a definition that is relevant to the taskforce and should be done also by other companies and bodies in defining their own use of innovation. The various definitions involve elements of change and can be found in various forms, however, limiting types of changes to four categories allows an understanding of the areas of business where innovation is provided a category to develop.

Tidd and Bessant acknowledge four broad categories, where opportunities for innovation exist in the following areas:

- **Product Innovation** – see changes or alternatives in products or services that a company offers
- **Process Innovation** – occurs when there is a change in the way products and services are developed or the way they are distributed or provided
- **Position Innovation** – identifies the changes that ensue depending on the context the products or services introduced
- **Paradigm Innovation** – involves an overall change in the inherent mental models which mould what the organisation does

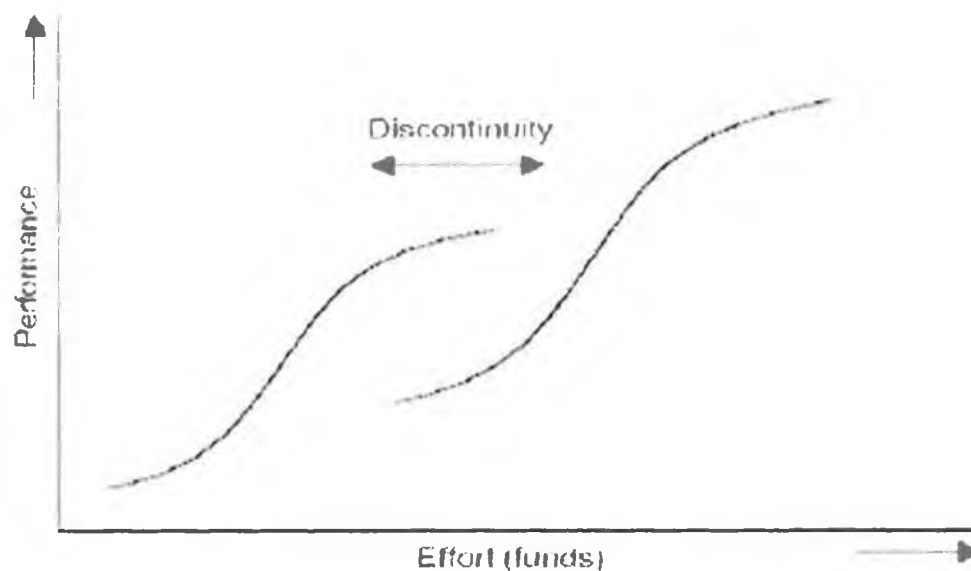
(Tidd and Bessant, 2009)

Recognising the areas innovation occurs, allows a company enhanced understanding to acknowledge the nature of innovation throughout the company and ensure sustainable competitive advantage can be developed or achieved.

3.3 Productivity through Innovation

In the context of relating innovation to productivity where productivity increases as a direct result of innovation, Porter combines both, where innovation drives productivity, increasing returns to capital and wages. New ideas and inventions do not just embody innovation, where enhanced knowledge gathered or achieved through research and development commends innovation where the implementation and use of knowledge acquired, leads to success or profit creation. The investment of time and effort in improving a product, service or process can be used as an indicator of innovation capacity. In measuring this relationship the “S-Curve Theory” shows the relationship between effort and performance.

Figure 3.1 S-Curve Theory



(Goffin and Mitchell, 2005, p. 109 and Foster, 1986)

This figure shows the alliance between effort of investment into improving a product or process and the results attained through that investment. Similar to the life cycle of products, the initial state requires the majority of investment and effort at the start of early performance which is slow, eventually through incremental growth performance reaches its peak out performing other products or services and finally levels off as performance reaches its limits, where discontinuity may occur resulting in a new product or service with a new S-Curve (Goffin and Mitchell, 2005).

Foster (1986) related the S-Curve to the impact and introduction of new technologies showing technology in its infancy stages as it grows. The majority of innovations are associated with improvements in technology and the introduction of new technologies and also showcases the catastrophic effects of technological discontinuity in S-Curves, where new technology replaces established or mature technologies resulting in the older technology or processes becoming obsolete. The effort of research and development provides companies with the ability to enhance knowledge of overall improvements needed and technologies available to the company, whether developed in the company or adopted from an outside source or competitor for the company (Katz, 2004).

3.4 Types of Innovations

Mapping innovation in a company for overall development of an innovation strategy for the company and establishment of innovative culture is a major challenge facing many businesses. As a company identifies its core business processes or competencies, the exploration or focus on their current business requires the continual exploration and advancement in developing new competencies for the pursuit of radical and incremental innovation.

The organisational structure and company's approach to innovation may require different methods to innovation, where many theorists have debated the use of incremental over radical, however, relying solely on one over the other may not be sustainable. Balancing the use of both radical and incremental innovations, firms need to continue what they are doing well but also need to be aware of their business environment and company operations to avoid missing technological changes or not understand changing customer preferences and needs (Herzog, 2008).

Incremental Innovation

The majority of the time in business change occurs in an incremental manner where studies suggest qualities adopted from Japanese Total Quality Management Systems in continuous quality improvements are mirrored in the cumulative gains adeptness that are a result of continuous improvements over time being more efficient than occasional radical changes, known as competence enhancing. Quality improvements sustained through incremental gains provides a strong basis for any business in continually creating space and stretch around an innovation where further products, lines and services can be created, with innovations managed (Tidd and Bessant, 2009 and Tidd et al, 2005)

Radical Innovation

Radical changes in contrast to incremental innovation involve doing something different, which may completely alter the way we think about or use a product or service. These innovations occur occasionally and may be more common to a particular sector or industry in business, being associated with discontinuous innovation or competence destroying innovations. Engaging with discontinuous innovation often leads businesses to rethink the way things are done caused by globalisation, environmental and social challenges and also shifts in technology (Tidd et al, 2005). Discontinuous innovation is often described as “the rug is being pulled out from under you” (Von Stamm, 2008, p. 485). Disruptive Innovation is also used to describe radical innovations describing this innovation as having completely new attributes resulting in entirely new markets being opened up with existing ones being reformed offering a seemingly inferior product or performance than incumbent ones (Von Stamm, 2008).

In the majority of industries a mixture of the two types of innovation from one extreme to the other are both used in business in running the day to day functions and quality competencies of the business and the introduction of new ideas or changes that are radical and impact greatly on the way business is done, where strategic advantages can be gained through innovations used in the company:

Table 3.1 Strategic Advantages through Innovation

Novelty in Product or Service	This involves offering something no one else can, where the company can consistently offer new and improved products
Novelty in Process	Where better or faster ways of doing things allow costs to be better managed and even lowered, gaining competitive advantage that others cannot match
Complexity	Competitors may find certain processes or developing products difficult to master
Legal Protection of Intellectual Property	Requires a licence to be acquired or fees that must be paid to allow them to operate
Add/Extend range of competitive factors	Competitive factors may be based on product offering or price and quality of the item
Timing	“First Mover” advantage can allow a company to gain significant market share in new product markets. Not moving or adapting quickly may result in early mistakes being made and competitive advantage being lost
Robust Platform Design	This type of platform allows a strong basis for variations of product and processes to be developed
Rewriting the Rules	The development of a completely new product or process makes the old way of doing things or older product versions obsolete, where new processes and business models are drawn up
Reconfiguring the parts of the process	The core elements of the business model may require reorganisation that may involve outsourcing or introducing a new network of operations
Transferring across different application contexts	Already established elements may be transferred to different markets

(Tidd & Bessant, 2009, p11 & 12)

A number of strategic advantages can be gained from the use of innovation in organisations to utilise resources and sustain the incremental and radical development of the business, however in order for innovation to be strategically developed throughout the company and result in successful sustainability and profitability of the company, the overall culture of the company must conducive to innovation with all employees involved at every level of the organisation.

3.5 Innovation Culture in Organisations

In order to support, sustain and continually enhance innovation the overall structure and culture of the organisation must be involved, committed and cooperate with all involved in the company in order to develop an innovative climate. Corporate Culture is defined as “the character of a company’s internal work climate and personality – as shaped by its core values, beliefs, business principles, traditions, ingrained behaviours, work practices and style of operating” (Thompson et al, 2008, p. 386). In understanding a company’s culture it is important to identify the key features of an organisation’s corporate culture, which include:

- Ethical Standards, values and business principles that top management minister over the company and perform throughout the organisation
- Official policies, procedures and operating practices that guide the approach taken to people management in the company for the overall running of the business and the behaviours and standards expected from all employees
- The work climate and character of the workplace in terms of creativity, competitiveness, any business change or turmoil and emotional commitment to the company
- Interactions between staff and management in understanding communication and teamwork
- Company traditions, guiding how things are done and will always be done
- Relationship of the company with external stakeholders such as, suppliers, customers, local community, competitors and other agencies

(Thompson et al, 2008)

In understanding how culture relates to innovation, the key features of culture can be used to identify how well an existing culture supports innovation throughout the organisation as an initial step. After applying the key features in determining the support of the company toward innovation, the desired or appropriate culture of innovation that is relevant to the company is identified before the final stage of adjusting the organisation's culture or modifying the culture can be developed. Changing culture is a difficult yet necessary aspect for under performing organisations where culture or the way things are incrementally done every day are acting as a hindrance to innovation and overall company sustainability and long-term development. Modifying culture may be realised through the following moves:

- A clear innovation strategy should be communicated by the CEO and management to give autonomy and leadership to the business divisions in developing new products, services or markets
- Each unit is allocated goals that correspond to innovation and overall strategy when goals are communicated regularly and reported throughout the organisation
- The development of cross-functional teams that facilitate effective communication and drive developments and projects appropriately
- Operations managers or process manager should be heavily involved in project management of the change making direct contributions and acting as champions for the overall cultural change process

(Goffin and Mitchell, 2005).

In developing a strategic framework for innovation the following elements should be used:

Table 3.2 Developing a Strategic Framework

Strategic Analysis	Systematic Analysis is essential in building multiple perspectives in determining realistically what a company can do and enable course of action to be identified.
Strategic Choice	Determines which resources the company will use or which strategic proposal to focus on or leave out and identify specific goals to follow.
Strategic Monitoring	Reviews the current strategy to confirm if the strategy is implemented correctly and is continually supporting the business goals and also identifies any challenges of the strategy.

(Tidd & Bessant, 2009, p. 214&215)

Achieving a culture of innovation that boosts innovation performance, achieves commercial advantage and creates a focused innovation strategy for the company is the desired outcome of changes in culture; however, a culture can emerge that stifles innovation also. Common blunders that occur in organisational cultural change include strong hierarchical control with little flexibility, uncertainty and lack of confidence and commitment to innovation, lack of recognition of changes needed and of key players in the organisation and not communicating effectively to employees that innovation is the responsibility of all employees throughout the company (Goffin and Mitchell, 2005). In many cases innovation happens without senior management within an organisation and much success occurs through the tactical involvement and knowledge of natural leaders within the company. The direct involvement and contribution leaders make to the organisation can be highly significant where intellectual stimulation and influence on other workers by leaders has a stronger effect on organisational performance. Leaders not only act as effective communicators but also can be an integral part of strategic decision-making (Tidd and Bessant, 2009).

The key features of an organisation's culture are a fundamental element to the overall innovation process in a company in achieving strategic advantages through radical or incremental innovation or a mixture of both. Understanding the structure, culture and needs of a business are essential in defining what innovation needs to an individual company or organisational body. In order to understand innovation further, innovation in action will be discussed in the following section in an attempt to understand how natural resource companies are being innovative and if radical or incremental developments in innovation have enabled successful innovation to occur or provide an insight into the factors that may inhibit it.

3.6 Innovation in Natural Resource Companies

SMARTOCEAN Innovation Strategy

Ireland's ocean domain is approximately ten times the area of its landmass with 220 million acres of marine surroundings, where the opportunity for a new strategy for ocean technology announced in April 2010 has recognised a new platform for marine exploitation, inaugurating ocean innovation as a possible rejuvenation source for the current economic climate. The SMARTOCEAN Innovation Cluster Strategy was launched in Galway in March 2010 for consultation in an attempt to merge science and technology investments with present I.C.T. in order to develop new products and services for global enterprises.

In an attempt to place Ireland at the hub of ocean innovation, the involvement of multinationals, government bodies, SME's and universities seeks to bring together expertise and enhanced knowledge transfer, where technological changes are global and are not confined to national standards. The Marine Institute in coordination with the National Centre for Sensor Research (NCRS) in DCU and a selection of industry and research agents, are involved in the Advanced Marine Technology Research Programme that creates an industry focused research assembly in the areas of intelligent systems, sensors and sensor platforms (IDA, 2010).

Facilities in Galway Bay include a network of sensors call SmartBay to gauge research and further test areas in coasts, oceans and bays around Ireland for environmental testing and demonstrations and showcasing of new equipment, technologies, concepts and solutions in a real life context. IBM, using SmartBay facilities to trial a package used in financial markets.

The opportunities SMARTOCEAN offer to SME's and other institutions enhances overall learning and innovation transfer across the marine community in Galway and Globally. Although this innovation focuses on areas of technology creating linkages between the marine industry and I.C.T., its important also to recognise key individuals that lead and drive projects in coordinating and communicating the need for new linkages with other bodies in industry between I.C.T. and marine environments. Professor John Delaney, oceanographer at University of Washington and Dr. Barbara Fogarty, national coordinator of Advanced Marine Technologies recognise the importance of the advancement of research through use of technology in marine environments, placing Galway at the hub of ocean innovation in Ireland, highlighting the importance of this natural resource to the region (IDA, 2010).

3.7 Conclusion

Defining innovation is essential to any business operation or institution where the term innovation is used, making the innovation used relevant and essential to the business. Whether innovation is incremental or radical is highly debated among theorists, with the author recommending the use of both innovations, as is often the case in business, where continual upgrading and improvement is needed on an on-going basis but occasionally something new is introduced or changes operations causing upheaval and radical changes in the organisation. The creation of commercial benefits from innovation utilises the success of innovation and confirms the reinforcement of something new or different to rejuvenate the economy and rural areas along the West of Ireland.

Innovation is associated with commercial success, however innovation can live on past a product or service lifecycle and even live on past a current business and is often carried by leaders or individuals in the business.

Utilising our natural resources along the West coast of Ireland is essential to further research and development of innovations in the region. Although innovation is often associated with technology, innovations are increasingly occurring in the development of food, cosmetic and agricultural products derived from an abundance of biomass along our coastline and can be found in individuals and throughout the organisational structure. In the development of research methodology in the following chapter, the research is reflective of the topic of innovation in requiring mixed methods of research to gain increased understanding and a true picture of innovations occurring in the Galway Region and even how individuals within the company perceive innovation as a further context past leaders being the drivers to innovations in the understanding of capturing knowledge from the innovation culture within the organisation.

Chapter Four

Research Methodology

4.1 Introduction

Chapter three generates an in-depth examination of research methods used in developing the relevant research methodology employed. The various forms of research available are discussed with methods chosen identified and examined in order to answer the research question. Chapter two identified academic literature and international models of innovation with current innovation processes used in maritime industries discussed. This chapter seeks to examine how relevant or accurate methodologies are to the Western region in overall developing academia on the subject of innovation in maritime companies along the West coast of Ireland.

The Chapter discusses the research methodologies available and justifies the author's choice of using both quantitative and qualitative research. Also to justify the purpose of the study, the research process is shown as a tool in answering the research question. Through the use of case study analysis and an innovative audit carried out on a number of natural resource companies in the Connemara region, as an example of natural resource companies operating in the west of Ireland and generating revenues in the local area. Taking into account the nature of the research and participants involved, ethical considerations guide the research process in order to develop honest and true information that conforms to the author's own standards in respecting the companies involved.

4.2 Research Requirement

The researcher focuses on innovation processes used in natural resource companies in the Western Seaboard with particular focus on the maritime industry. Irish natural resource companies established in the West coast of Ireland were chosen to represent maritime organisations that are an excellent example of innovative businesses utilising natural resources in their region. In arriving at this specific focus the researcher began with many research question, many of the questions were eventually discarded by the author or in discussion with supervisor, due to lack of available quality data, inaccessibility of information or time frame limitations. The refined set of questions encompassed the following:

What innovations are natural resource companies in the maritime sector using?

How are these companies being innovative with natural resources?

Will the innovations used by these companies aid company development and progression in the future?

Is the innovation taking place confined to the business or is it an integral characteristic of individuals involved in the company?

How does innovation become or not become so intertwined in a company structure?

4.3 Research Methodologies

Methodology is the rationale and analysis of particular methods used in any given study of research. Jankowicz (1991) states that a method is an orderly and systematic approach taken in collecting relevant data (Jankowicz, 1991).

An additional definition of business research is identified in its truth-seeking function where it “seeks to predict and explain phenomena that taken together comprise the ever changing business environment.... a truth-seeking function that gathers, analyses, interprets and reports information so that decision makers become more effective” (Hair et al, 2007, p. 5). Furthermore, Cameron and Price (2009) refers practical business research as “any systematic attempt at collecting and interpreting data and evidence in order to inform thinking, decisions and/or actions in relation to an issue of interest to an organisation and/or its stakeholders (Cameron & Price, 2009, p. 4).

As many theorists have stated definitions on research and business research it is clear that research is focused and driven towards broadening knowledge and data on particular issues. Research is charged with the purpose of investigating problems and questions encountered that require resolution or solutions. It develops the necessary and relevant information for making informed decisions as a result of data gathered first-hand or already available as developed within the literature review in Chapter two, where data collected through investigations and analysis can be quantitative or qualitative (Sekaran & Bougie, 2010).

4.3.1 Qualitative and Quantitative Research

A clear distinction exists between qualitative and quantitative research, where qualitative data involves descriptions of things that are made without any numerical assignment to the data using unstructured interviews or observation where words, pictures or phrases are recorded. Quantitative data in contrast uses measurements where numbers are used directly as a representation of the characteristics of something that is recorded with numbers allowing for statistical analysis (Hair et al, 2007, p. 151,152). The distinction between the two terms is helpful in understanding what is required by the researcher in order to examine and interpret the data gathered, in a meaningful manner. Saunders et al, (2009) reference Dey, (1993) quoting “while number depends on meaning, it is not always the case that meaning is dependent on number”, where the more elaborate the concepts are the more difficult it is to quantify the data (Saunders et al, 2009, p. 482). Qualitative data provides the opportunity to explore data or a subject in real time and in as real a manner as possible using conceptualisation in analysis of data, where quantitative conducts analysis through the use of statistics and diagrams using standardised and numerical data (Saunders et al, 2009).

With qualitative research the development of hypotheses are less frequent, where the concern in developing hypotheses, is that it will influence the direction and outcome of the findings, where in quantitative research, strengths of the study undertaken lies in the structure and representativeness providing objectivity in the testing of hypotheses through the application of statistical criteria to the measures. The researchers opinion does not affect or influence the hypothesis test in contrast to qualitative research requiring subjective interpretation (Hair et al, 2007).

The debate whether to use qualitative or quantitative remains greatly contested by many authors arguing the superiority of one method over the other, however effective decision making often requires the input from both sources of research, relying on both qualitative and quantitative methods in order to make fully informed decisions.

It is important to recognise the relationship the two methods may play with one another in the alliance the two may form where qualitative research may be instrumental in developing ideas that can be tested with some sort of quantitative approach (Hair et al, 2007). It is through using both approaches that the author decided to use both measures of quantitative and qualitative in conducting research, using case study analysis of an Irish company in the west of Ireland and conducting an innovation audit through survey analysis of employees within the company to develop an overall examination of innovation present within the company, even using both methods a number of ethical considerations are examined as a premise to any method or mixed methods used.

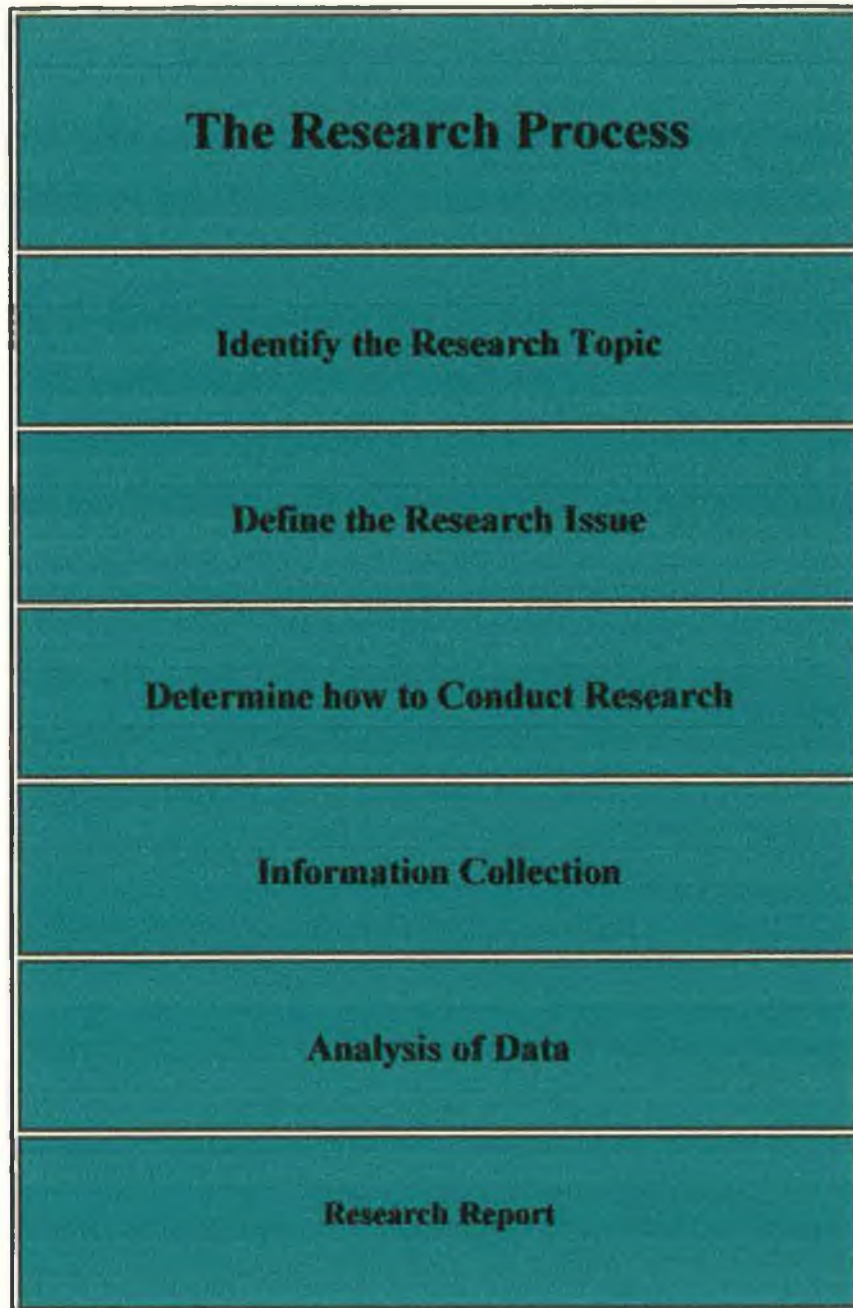
4.4 Ethical Considerations

The word “Ethics” in common everyday use is generally understood as “doing the right things” and although this statement is very straightforward and easily comprehensible, the more it is thought about the more complex the issue of ethics is (Cameron and Price, 2009, p. 117). Ethics is a word society is familiar with and is a repetitive term used in media describing and discussing the conduct of organisations (Cameron and Price, 2009). Research also demands ethical behaviour from all its participants “Ethics are standards of behaviour that guide moral choices about our behaviour and our relationships with others...the goal of ethics in research is to ensure that no one is harmed or suffers adverse consequences from research activities” (Cooper and Schindler, 2001, p. 112). The ethical considerations of the researcher in dealing with management, respondents and the researcher’s own personal integrity should guide the research before, during and after findings and recommendations have been completed (Hair et al, 2007). The researcher at each stage of research has legal, professional, cultural and personal obligations with each of the author’s obligations inter-linking to guide the overall ethical considerations of research (Cameron and Price, 2009). In conducting research for completion of the thesis the author has considered ethical obligations towards the participating companies, the integrity and association with the college G.M.I.T. as research is completed as part of the course and the researcher’s own principles and honesty in completing the research.

4.5 Accessing Data

In order to develop the research methodology, it is essential to undertake a research process as outlined in the table below, describing the process before the actual process carried out by the research is discussed later in the chapter.

Table 4.1 The Research Process



(Cooper and Emory, 1995)

4.6 Theoretical Framework

Having identified the main issues to be researched and gaps currently in the literature review that require further primary investigation in order to answer the research question and identify innovative comparisons in companies in the Western region, the next element of research requires the designing of research in such a manner that the required data can be analysed and gathered to arrive at a solution and final recommendations being offered (Sekaran and Bougie, 2010).

In addressing the main issues it was decided that the research methodology would follow a two phase framework of exploratory research and descriptive research.

Exploratory Research

Exploratory research is a resourceful initial step in the development of more extensive research where chapter two of the thesis compiled the literature review with extensive research of libraries, articles, databases, the Internet and publications by marine and government bodies. In development of case study as a method of research, articles and publications were found on Rí na Mara and Cleggan Seaweed Company giving company details in order to establish initial contact with the company. Although company publications and websites were resourceful in providing certain literature on the company and for providing basic background information, it was however, inadequate for compiling a full case study on the company and required an experience survey to be undertaken by interviewing “expert” in the subject (Saunders et al, 2009, p. 140). The research benefited by seeking information from individuals experienced in the company and area of study through interviewing key individuals in each of the companies who were identified from research as natural resource companies engaging in innovative practices in the Western region (Cooper and Emory, 1995).

The experience survey involved telephone interviews and email correspondence with the companies in order to obtain up to date information on the company who were identified through web searches and articles found during the literature review. As it was not possible to contact all relevant natural resource companies operating along the West coast, the author used own personal judgement in selecting companies to contact. The interview lasted up to 30 minutes providing valuable insight and expert opinion and was resourceful as a relevant data collection instrument. It was further instrumental in agreement of conducting the innovation audit that was sent via a link in an email to individuals in the company in providing the stage of research towards descriptive research.

Descriptive Research

In order to convey an accurate event, situation or profile of a person, descriptive research is often used as referenced by Saunders et al, 2009 from Robson, 2002, page 59, and is often an extension of exploratory research (Saunders et al, 2009, p. 140). Descriptive studies are essential in many situations where qualitative data obtained through interviewing individuals in exploratory research acts as the guide to advance understanding and provide systematic probes in explaining situations through quantitative data that is necessary in conducting descriptive studies enabling data to be understood through:

- Understanding the characteristics of a given situation or group
- Aspects of a given situation can be analysed systematically
- Ideas are offered for further research and investigation
- Decisions can be made (Sekaran and Bougie, 2010)

As quantitative and qualitative have been distinguished between numeric and non-numeric data, the research undertaken by the author involves both methods, a “mixed methods approach” is the term used (Sanders et al, 2009, p. 152). Using interviews at the exploratory stage is effective in order to disclose the key issues before developing a survey or questionnaire for exploratory or descriptive data (Sanders et al, 2009).

The progression of research towards descriptive studies is necessary to further scrutinise the area of innovation in the organisations. As innovation is a theory and process that is fundamental to the entire organisation in being perplex in nature. In order to assess innovation and the perception of innovation throughout the different levels and departments of the organisation an innovation audit will be conducted as a technique to incorporate topics, which arose from the interview.

4.7 Alternative Methods of Research

As researchers generally choose between exploratory, descriptive or causal design, the author has chosen to use elements of exploratory in the literature review and descriptive by compiling empirical evidence in the form of interview and an innovation audit, other methods of each of the three research designs that alternatively may have been used are as follows:

Focus Groups

As exploratory research is heavily reliant on qualitative methods other approaches include the use of focus groups in an attempt to elicit information from a group of people rather than individuals. "Focus groups involve a facilitated discussion between members that is focused on a topic or area specified by the researcher" (Cameron and Price, 2009, p. 396). It involves organising a group to hold a discussion that is focused on a particular issue or topic, facilitated and promoted by the researcher. This method can see discussion lasting for up to two hours, where most participants are prompted and react to comments made by others in the group rather than a contribution made by the researcher, allowing the researcher to observe the interactions between candidates where a good group can be synergistic where ideas are sparked from each of the other members allowing different perspectives to surface (Cameron and Price, 2009).

This method however, was not felt to be suitable to research in facilitating the group and finding companies willing to allow staff to engage in discussion on or off company time. Arranging a location and organising the event was deemed to be time consuming and expensive in providing the facility and refreshments. Recording and capturing all opinions and discussions caused concern for the author in not recording points raised, properly, leading to untrue or misleading evidence. As the author would not be acquainted with members of the group, the researcher did not feel confident in controlling the group and arrangements for recording.

Action-Orientated Research

Action research is considered to be an approach rather than a research method where no specific data collection method is used and instead many different methods are used. It is a highly complex and specific approach to research and associated with the interdependence of doing and knowing and is distinguishable in the collaboration of others, repeated cycles of actions, the enduring involvement of the researcher and the rigorous approach taken to the process as a whole. The research calls upon relevant ideas that may be developed further through informing or bringing about change. "Action Research describes a cyclic process of planning, action and evaluation directed towards improving both understanding and action" (Cameron and Price, 2009, p. 320). Substantial time investment and ownership is needed normally from colleagues and the researcher, it requires an open mind and the ability to reflect continually and intensively in a critical manner relying on a contextual knowledge, assuming things exist when they do not or are not inevitable.

Although highly effective, this method was found however to be highly demanding and not feasible or suitable to research. Answers may be easily interpreted in order to confirm what the author already knows, where the researcher must constantly be aware of own preconceptions in order to continue to probe and challenge the research. As Action Research can change with every cycle further demands are placed on the researcher in order to commit a lot of time to working this way (Cameron and Price, 2009).

Causal Research

Using this method of research requires the researcher to test whether or not one incident causes another, where a change in one event may have a domino effect in bringing about a concurrence in another causing change. Ultimately, causal research is defined as “does X cause Y?” (Hair et al, 2007, p. 160).

The four conditions researchers examine in testing cause and effect relationships include: the time sequence of the cause that is required to occur before the event; covariance measuring the change in the cause that is associated with a change in the event where two variables are interdependent and related to each other; a relationship that is true and not as a result of another event that just happens to affect both the event and the cause, is known as nonspurious association requiring other potential causes to be eliminated or controlled; theoretical support provides a logical explanation in determining why the cause and effect relationship exists (Hair et al, 2007).

The complexity and length of time taken to plan and execute causal research was not found suitable to the authors methods needed in answering research and was found to be expensive, where the following methods of research were found to be congruous to research.

4.8 Research Methods Used

The search for research methods that envisage a holistic view of organisational issues has led to greater use of qualitative methods such as case study research. Case study research is an empirical examination, which investigates “a contemporary phenomenon within its real life context” (Yin, 1984, p. 13). This definition by Yin gives the researcher the rationale and basis to use case study research as a method of investigation. Case studies place more emphasis on full contextual analysis of a few events or conditions and revolves around the observation of select situations or environments. The purpose of such observation is to probe deeply and to analyse the unit of interest in an attempt to develop generalisations about the wider environment to which that unit belongs (Cohen and Manion, 1980).

Although some critics contend that case studies play a limited role in knowledge accumulation, faring poorly at being good quality indicators and are not generalisable and is indeed a fair criticism, however the author offers an adequate basis for some degree of generalisation from the conducted case study (Adams and White, 1994). An issue within a single organisation or a certain issue across a broad number of organisations may involve research to undertake two or three cases, but a single case is highly labour intensive and may be more appropriate or logical in examining the interactions between the variable issues in a real life context, allowing a degree of generalisation that is subjective to the case and not beyond that case. The case study approach focuses on understanding a specific issue and makes this research method a particularly useful approach where the issue being addressed is a fundamental component to the fabric of the company (Cameron and Price, 2009).

The author’s decision in using a case study approach is appropriate to the issue of innovation as the area of innovation within companies is multi-functional and infiltrates many areas of the company, therefore a variety of methods are required in order to understand it. A multi-method research strategy is a distinctive element in using a case study approach in order to develop a coherent set of findings from different methods (Cameron and Price, 2009).

As discussed in Chapter two, the innovation process was described as a learning tool and is adaptive in enabling organisations to survive. As part of a company's disposition to learn how to manage innovation and capture knowledge, firms should undertake some sort of a review of innovation to develop innovation capability. By developing a structured framework in order to examine innovation, the innovation audit proposes a method of reflecting on the process of innovation and how it is managed (Tidd and Bessant, 2009).

Using the innovation process discussed in the literature review in Chapter two, Tidd and Bessant have constructed a checklist of questions to direct at companies or organisations using information on successful and unsuccessful innovations. The literature and professional research provides the basis in arranging a system to reflect and capture knowledge. The audit was constructed on Survey Monkey (see Appendix 3) in the form of a likert scale, designed to examine how strongly subjects agree or disagree with statements on a five point scale with the following anchors:

Table 4.2 Ranges on Likert Scale

Not True	Slightly True	Average	True	Very True
1	2	3	4	5

A particular concept or variable can be examined item by item where responses make it possible to calculate a total of a summated score for each respondent by summing across items. Likert scales are generally recognised as interval scales, the scale allows certain arithmetical operations on data collect from candidates and measures the distance between any two points on the scale, in ascertaining the extent of the differences in preferences among respondents (Sekaran and Bougie, 2010, p. 144).

After respondents have completed the survey the totals of the survey are added up by grouping the five categories together:

Question 1, 5, 8, 12, 19 and 22 deal with Strategy

Question 2, 16, 20, 23 and 25 deal with Process

Question 3, 9, 13, 17, 21 and 26 deal with Organisation

Question 4, 7, 10, 14 and 18 deal with Linkages

Question 6, 11, 15 and 24 deal with Learning

Plotting the values are done on the innovation audit chart provided by Tidd and Bessant on the resource website. In effect the chart is a radar chart also known as a web, spider or star chart. The spokes radiate from the centre point of the chart with lines connecting them like a spider-web. The measurements show the variables that contribute to the overall assessment, where all variables are envisaged to be of equivalent importance. The radar chart required the variables measured, to be identified. As Tidd and Bessant identified variables relating to innovation; Strategy, Learning, Linkages, Processes and Organisation were determinants of variables used. However, other quality tools such as brainstorming may be deployed in order to ascertain variables.

The measurement scale is then decided with each variable using the same scale such as 1-5, where the most desirable end of the scale is determined. In order to draw the chart each spoke is labelled with a variable, radiating from the centre point with the measurement marked on the spoke with a large dot, where dots are then connected. A separate chart is drawn for each company in order to separate results. Overall performance can be assessed with results of the variable positions on each spoke, making radar charts highly effective for displaying at a glance, which areas need improvement or where progress or strengths lie (Tague, 2005, p. 437 – 439).

Sample Population

In conducting the research the author contacted approximately 35 natural resource companies operating in the West of Ireland in various trades of the marine sector. The marine institute and the Internet were resourceful in providing names of:

- Research companies
- Seaweed processing companies
- Cosmetic natural resource companies
- Sea Food Companies
- Fisheries

Contact was initially established with companies through customer service or “contact us” information request email addresses given on company websites, where companies without accompanying email addresses were contacted by telephone from contact numbers given on the Irish Business Directory, the Golden Pages and through Google searches for the company’s web page. Before sending the initial email to introduce the author and research requirement, the author contacted the company to ask for names of key people in departments and to inform the company that the email would be sent. Some emails were sent directly to key individuals where responses occurred within the same day or next where any later than the initial two days no response or interest from the company was obtained (See Appendix 3). Following no response, the company was contacted within 5-14 days by telephone to gain information.

The majority of companies were not interested in conducting personal interviews due to time constraints or lack of interest, however, more of the companies were interested in the attached survey of conducting the innovation audit, with one company in particular requesting an audit to be conducted on their company by the researcher at a later stage of next year, which the author is due to undertake in February following the commencement of structural changes in the organisation and post changes in the company, which has enabled the author to achieve a personal objective of knowledge sharing and transfer within the natural resource sector.

Case Studies were undertaken on Rí na Mara a seaweed based cosmetic company operating in Spiddal in County Galway and an additional company who’s full disclosure of information obtained was not given with consent not given to the author to use the information, however the data obtained will not be used and was subject to not using the company name and will be called “Seaweed Company”.

The data collected from the innovation audit will use information obtained from two companies, Rí na Mara and Cleggan Seaweed Company. With 28 respondents from the companies the author did not use additional survey responses obtained from companies due to time restraints with audit results forwarded to corresponding companies.

4.9 Justification of Methodology

The author's decision to use both qualitative and quantitative research methods shows the relationship between the methods of research and the topic. As innovation as a process takes into account emotional elements and factual components in developing its strategy and communicating this throughout the culture of the organisation (Tidd and Bessant, 2009, p. 317), the relevance of using both methods in order to adequately support and answer the research question is adamantly substantiated by the author in capturing knowledge developed through research. The appropriateness of methodologies have been outlined by Yin, 1984, p. 16 in underlining three conditions, which distinguish when to use each strategy and what they should consist of:

- The type of research question stated
- Extent of control the researcher has over actual events
- The degree of focus on current events as opposed to historical

The use of case study as a method of research analysis is justified as it focuses on the contemporary issue of innovation that is a phenomenon in industry and in many environments worldwide and also acts as an appropriate method in providing solutions to the research question. The development of the case study highlights additional issues that may not be answered in the case study that apply to alternative variables that may be probed and investigated further through quantitative methods. Verifiable evidence is gained through quantitative research allowing the researcher further control over the information required, where using a range of different factors discussed in one method is used first in the case study to facilitate the use of the second method in the innovation audit (Cameron and Price, 2009). The innovation audit provides an overview of statistical evidence that relates to issues discussed in the case study that become variables as points to be analysed in quantitative research (Tidd and Bessant, 2009).

A combined approach overcomes any short fall or weaknesses in any individual method, each of the methods compliment each other allowing the researcher to gain a more complete understanding of data gathered in order to sync the results together in connecting the responses where they relate back to the research question and the literature review. The theory of innovation is adequately grounded in the data from both methods, acknowledging the appropriateness of both methods used by the author.

4.10 Conclusion

A mixed method process for data collection and further understand of information gathered was the preferred method used by the author. This method reflects the broad nature of the topic of innovation where in order to develop accurate and relevant research both methods are required to provide a comprehensive interpretation and understanding of innovations used in natural resource companies and how innovation is perceived throughout the company. The justification of using case study analysis and an innovation audit is confirmed as an accurate method in the literature reviewed through the research methodology. Although the author has taken into account additional research methods available in conducting accurate and relevant research, time constraints and other factors have justified the use of case study analysis in discarding the use of available alternative methods. The following section develops a case studies on companies in the West of Ireland that have been recognised as innovators in their field, using natural resources that are available and easily accessible from the Galway region. The case study gathers a qualitative view of the company where findings from the research will delve deeper into answering issues raised during research.

Chapter Five

Findings

5.1 Introduction

The Research Methodology provided the foundation for the development of case studies and instils confidence in the author in her use of case study as a form of qualitative analysis. In discussing the key areas of the business the case study provides a full contextual analysis of various areas of the business will be discussed in order to focus on the topic of innovation and how innovation occurs throughout the business.

The case study on Rí na Mara, highlights the viability of our natural resource as a source of revenue and development in the West of Ireland. This award winning company has built its recognition and reputation through the quality of its products and through the passion for skin care and expertise of its founder Deirdre Uí Chathmahoil. Offering an extensive range of high quality, seaweed based cosmetics that are developed in Spiddal, qualifies the utilisation of this natural resource as sourced from natural resources from the West Coast of Ireland. Development of the business in Ireland has positioned the product ranges in various pharmacies, health shops and business distributors throughout Ireland where the product has expanded its market towards the U.S. market and Australia.

The potential for growth of the company in the cosmetic industry is high, however the competition in this sector is considerably high and requires the company to think globally rather than locally if they wish to continue with sustainable business efforts.

5.2 History of Rí na Mara

The company is currently six years old as Deirdre Uí Chathmhaoil founded it in 2004 after a long term dedication and love for dermatology leading to the development of the company Rí na Mara. Through years of research and development on the cosmetic and healthcare benefits of the seaweed resource, the varieties of seaweed along the West coast of Ireland provide ample opportunities to develop and research products through the utilisation of this natural resource. Although the company is in the relatively early stages of its life cycle the potential of growth through innovation presents the company with future growth opportunities in producing new products to broaden the product base and cater for a wider range of consumer preferences.

Deirdre was born in County Tyrone where her mother and father ran a clothes shop and a local grocers, instilling in Deirdre from an early age a business mind and acumen that would resurface through her own business Rí na Mara in later years. Moving to London in the late eighties provided the forum for working with the renowned Institute of Dermatology in St. Thomas Hospital in London as a staff nurse, which nourished her interest in dermatology to create her path towards gaining expertise in dermatology.

Further study resulted in researching Cosmetic Science at De Montfort University, who are recognised for its top quality expertise in cosmetics and skin care, ensuring Deirdre was learning from the best and some of the most professional experts in the industry. This research introduced Deirdre to the nature of seaweed as a beneficial skin care source where research in the area of seaweed based cosmetics led to applied research to develop expertise in other European countries such as Italy, France and Spain where seaweed is regularly used in healthcare. After 3 years of research and development throughout Europe in particular France and investigating the feasibility of setting up a seaweed-based cosmetics company in Ireland, it was discovered the same species of sea plants were available in abundance off the West coast of Ireland, being of high quality and growing in the purest waters in Europe.

Although the life enhancing healthcare properties that occur naturally in seaweed have been recognised for centuries in cold remedies, for conditioning and fertilising of soil, agricultural animal feeds, food products and bathing and cosmetic properties, a lack of utilisation of the resource provided Deirdre with the opportunity to develop a respect for the resource that is often prevalent in other European countries, where the properties of the resource are recognised and comprehended for regular use in healthcare.

5.3 The Company Begins

Moving to Galway, Deirdre worked in U.C.H.G and Merlin Park Hospital and also trained in Psychiatry after qualifying as a Registered General Nurse, but dermatology still held a strong interest for Deirdre that focused her strive and determination towards setting up a business in Galway following feasibility studies carried out in Europe with much research carried out in France.

The company employs four full time staff and four part time staff where hours can vary with demand and seasonal requirements such as Christmas and Mothers and Fathers Day, with Deirdre liasing over operations and overall running of the business. Deirdre's husband Seamus is also involved in the business and partakes in the company by selling and distributing the products to the various retail outlets acting in a sales representative capacity. Deirdre's four children are often called on to help with the running of the business in answering calls in the office and acting as commissioners for the products, giving the business a devoted and supported family run company.

Since the business is located near the family home where the warehouse, laboratory and office are also located the close knit operation allows a closer bond between staff and a high level of enthusiasm towards the product and the generation of employment in An Spiddal. Decisions can be made easily and discussed quickly as everyone has an important role in the business in addition to the business location where being Irish and positioned in the Gaeltacht is an additional resource to the product.

The local language is encouraged and spoken and makes the business proud to be Irish and creating employment in the region.

As a small business, the contribution each staff member makes to the business is recognised and allows sustainable development of the business. The workforce and business is small however the nature of the cosmetic industry ensures the business operates at an international level in building its market share through new product developments and entering new markets.

5.4 Innovation through Products

Research into the existing product range is ongoing in order to ensure continued development of products and the introduction of alternative products for customers in a bid to maintain innovative techniques through their product resources. New ideas are always encouraged at all stages of the business where quality of products are systematically approved to meet standards with commitment from staff in increasing product knowledge and overall knowledge in the business, fundamental elements of sustainable growth.

The company has created a unique combination of mineral rich extract when slowly and meticulously distilled to form the basis for the skin care range. As a company that embraces corporate responsibility and strong ethics towards the natural environment through use of the natural seaweed resource, all products are PH balanced, free of mineral oil and animal derivatives where products are not tested on animals and also biodegradable protecting the natural environment. As an environmentally conscious company, this appeals to their customer base that demand natural products, rich in vitamins and minerals easily found in our seaweed resource along the West coast of Ireland. The rise in health conscious customers and the preference towards organic natural products that are free from chemical and unnatural additives that are often found in many cosmetic products leading to adverse effects on the skin, has seen the move in customer demand toward natural ingredient based products where the source of the product is recognised and known. Customers are increasingly becoming knowledge conscious and curious about product ingredients and daily healthcare products.

Using a variety of seaweeds the company derives ingredients from the following seaweed plants: Laminaria Digata, Fucus Serratus, Chondrus Crispus, Ascophyllum Nodosum which are commonly known as dilisk, Carageen Moss or Bladder Wrack.

5.6 Recognition and Reputation

Since the company was launched in 2004, this Irish Seaweed Cosmetics Company offering marine extract natural products has been affiliated with a number of awards as follows:

- The marketing institute of Ireland voted the company “Connaught Marketing Champion 2007”
- Lá Viridian Award for Innovation
- Placed in top 50 Cross Border Achievement Award

Recognition achieved within the industry in a relatively short amount of time highlights the innovative and growing nature of the business through product innovation and expansion of its markets. Industry accolades have served to increase sales and brand awareness, which promotes the product to the broader market giving customers reassurance and increased knowledge on the product.

Being recognised and awarded amongst peers highlights the acclaim the business is receiving and promotes the business as an innovative and developing business.

5.5 Looking towards the Future

The recession has put strain on company resources and puts increased pressure on everyone involved with the company. The global market for cosmetics is a multi billion industry where competition is extremely high with market share held by Rí na Mara relatively insignificant in a global context. However, ongoing research and development is a fundamental development of the business and a priority for Deirdre with the following developments being made:

- Continual communication with retail outlets in renewing contracts and creating new contracts for expansion in Ireland. Good communication with our retailers will ensure merchandising standards are met and well displayed and communicated with customers in store
- Continued research on product enhancement in developing new products to appeal to new markets at home and abroad
- Enhancement of brand awareness through attendance of tradeshow in Ireland and Internationally to gain additional contacts and communicate with peers in the industry and new businesses
- Continual research on current and recent developments in the industry and current affairs
- Opportunities are available in new markets where the company currently exports to the U.S. market though the website. The company is also expanding to the Australian market with a new website developed for the Australian market.

5.7 Conclusion

It is clear that Deirdre is passionate about her business and is an expert in the area of dermatology. Her continued research and enthusiasm for the business is infectious throughout the business through her innovative products, productive and enthusiastic staff and her supportive family where recognition of her expertise and hard work has not gone unnoticed in industry through her many awards.

Expansion of the business to new markets is inevitable with sights set on developing their existing American market and broadening their Australian market with the development of the company's new website for Australia. Rí na Mara is just one example of a company operating in the West of Ireland that has utilised the natural resource of seaweed in its product extracts that appeals to increasing health and well-being consciousness' of consumers.

Through the following chapter, findings from qualitative research will be analysed in answering research questions with expansion of key points through findings and results of the innovation audit to give a more complete and justified research process that is relevant to the topic of innovation in natural resources in the West of Ireland.

Chapter Six

Case Study

6.1 Introduction

The case study allowed data to be collected on the company by providing a key overview of innovations occurring through product innovations in the company. In order to analyse data obtained, the researcher addresses key research questions, where further questions developed through the case study that were additionally examined through the innovation audit. The case study is first analysed before results of the innovation audit for Rí na Mara and Cleggan Seaweed Company (see Appendix 3) are compared with findings assessed under the key areas of the innovation audit to include: strategy, processes, organisation, linkages and learning.

The qualitative data obtained is complimented and further examined through the additional use of quantitative data to give a more complete and comprehensive analysis of the data collected.

6.2 Data Analysis and Findings from Case Study on Rí na Mara

Following Cooper and Emory's Research Process (1995) this second last phase of the process as part of the final stage of writing the final report, takes into account key research questions in order to meet research objectives set out by the author before research began. Addressing key questions through findings will provide further recommendations to be given by the author for discussion in the final chapter where the questions include:

- What innovations are natural resource companies in the marine sector using?
- How are these companies being innovative?
- Will the innovations used by the company, aid company development and progression in the future
- Is the innovation taking place confined to the business or is it an integral part of individuals involved in the business
- How does innovation become or not become so intertwined in a company structure

What innovations are natural resource companies in the marine sector using?

Rí na mara uses innovation through product innovations as categorised by Tidd and Bessant (2009) when highlighting the four categories of innovation with the other three being Process, Position and Paradigm. The company offers a new and alternative product to other cosmetic products on the market and is unique in providing a naturally resourced product that is unique to Ireland and the Connemara region in using natural ingredients that are harvested from the purest waters in Europe. The high quality of the product through Deirdre Uí Chathmhaoil's expertise in the field of dermatology is reflected and promoted through the product where the company undertakes continuous improvements through research and development of the product engaging in incremental innovations as opposed to radical innovation.

From the literature review in chapter two and three, the majority of innovations in the marine sector were found in areas of technology in research and development of Sea Change Strategy 2007-2013 and through the SMARTOCEAN programme. Although these innovations are highly lucrative and beneficial to building our knowledge capital resource in the maritime sector, it is important to recognise small businesses operating along the West coast of Ireland and the innovations they are currently undertaking. Although Rí na Mara is a small company the nature of the cosmetics industry allows their products to operate on a globally setting utilising the natural resources in the region and promoting the high quality and unique environmentally friendliness of the product to the world.

How are these companies being innovative?

Rí na Mara is engaging in incremental innovations through product innovations through continuous research and development. Although the company is in relatively early stages of its life cycle and as experienced steady amounts of growth over the past 6 years, the expansion of the company to the American market and the Australian market provides new platforms for growth operating in an international forum. Technological companies involved in SMARTOCEAN are also contributing to the international forum where major companies such as IBM have availed of the technologies offered on site in Galway for trials of new product software placing the West of Ireland at an international hub of developments. Ongoing research and development is a key factor to innovation in both sectors despite different functions of the companies and company sizes, however in order to keep up to date with current events and occurrences in the economy it is necessary for businesses to invest in research and development.

Will the innovations used by the companies, aid company development and progression in the future?

Deirdre Uí Chathmhaoil is focused on the future through development of brand awareness and gaining significant market shares of the American and Australian market. The use of natural products is a global concern where the demand for natural ingredients increasing over the past few years. Irelands clean and natural image developed through tourism benefits natural products exported from Ireland in their associated of being source from the purest waters in Europe. Research and development undertaken in broadening the product range to appeal to broader markets, widens their customer base and increases market share of the world's cosmetics market. Technological industries operating in the marine sector and research and development companies such as the Marine Institute have positioned themselves to be experts in continuous knowledge improvements and making radical developments in areas not yet researched through professionals working in the area and passionate about the natural resources offered along the West coast of Ireland. These companies are positioning Galway as a world class leader of innovations in the marine sector, where placing Galway at the hub of marine activities will enable sustainable development of the Region, contributing to the City, County, Island and Gaeltacht regions for overall economic recovery.

Is the innovation taking place confined to the business or is it an integral part of the individuals involved in the business?

The passion and drive Deirdre has for her business surpasses the business product and is an integral part of her nature. Innovation Deirdre displays is not just confined to her business but extends to the broader marketplace with her environmentally friendly products that respect the natural seaweed resource extracts used in her products. The innovation always spreads to the wider community in An Spiddál, where Deirdre was involved with the development of a childcare facility in the area that nurtures the Irish language and improves amenities in the local community. The Irish product itself is an ambassador for Ireland and the Gaeltacht area, where Deirdre promotes the Irish language in the use of the company name that means "King of the Sea" (Rí na Mara).

As seen in Porter's S-Curve, innovation is often transferred to additional new products or processes where a new life cycle begins, which is suggested by Porter as occurring through discontinuous innovation when the life cycle of the older product reaches maturity and is replaced by a newer product. However, Deirdre contradicts Porter's discontinuous theory where a new life cycle in the childcare facility is separate to the growing cosmetic products business is continuing to grow and develop, where discontinuous innovation did not occur causing the development of the childcare facility. Both life cycles are continuing to grow with the S-Curves of both in their infancy stages of development, highlighting that new and additional ventures can occur without the loss or destruction of the previous product.

The Marine Institute envisaged Sea Change Strategy 2007-2013 as an All-Ireland strategy with significant utilisation of resources in the West. As the institute engages in continuous innovation, knowledge transfer occurs incrementally throughout the industry and is recognised on an international forum. Passionate individuals in the industry push for research and development to take place in Western areas where Galway provides an innovative platform for research and development in areas of research and marine technology.

How does innovation become or not become so intertwined in a company structure?

As a small business, Rí na Mara finds communications and correspondence with staff very quick and efficient, where ideas and daily feedback occur on a regular basis ensuring all staff have a voice. The overall organisational culture caters for innovation to take place where the workplace is energetic and enthused by staff, with a lower hierarchical structure of control. According to Thompson et al, 2008, the structure of the company takes into account the ethical standards of the overall organisation, official policies, work climate, communication with staff and management and relationship with stakeholders. Their structure is conducive to innovation, however innovation often occurs in larger structures and bodies according to Thompson et al, 2008.

The analysis of the case study provided an overview of innovation in the industry by focusing on one area of the industry by profiling a natural resource seaweed cosmetics company. As additional questions were raised through use of case study analysis, an innovation audit seeks to delve deeper into innovation operations of the company by assessing areas of: strategy, processes, organisation, linkages and learning as a further attempt to discuss the topic of innovation in natural resource companies. The innovation audit conducted by Rí na Mara is compared with the innovation audit carried out by Cleggan Seaweed Company in order to compare innovations used in natural resource companies operating in the West coast of Ireland.

6.3 Innovation audit – comparisons of innovations in the Western Region

The innovation audit completed by staff members at Rí na Mara scored the following points that were plotted on the innovation audit graph (see Appendix 3):

Table 6.1 Innovation audit scores for Rí na Mara

	Average Score	Divide Score by 8
Strategy	35	4.375
Processes	23	2.875
Organisation	44	5.5
Linkages	27	3.375
Learning	29	3.625

Based on a likert scale rating from 1 to 5, where 1 is the lowest score and 5 is the highest and truest score to give, all points from the questions were added up to reach the total score before dividing the figure by 8 to reach the figure to be plotted along the spokes of the audit. Each of the five measurements are equal to each other where the perceptions of the respondents and employees within the company are used to complete scores and plot points of perception on each measure.

The innovation audit completed by Cleggan Seaweed Company scored the following points that were plotted on the innovation audit graph as follows (see Appendix 3).

Table 6.2 Innovation audit scores for Cleggan Seaweed Company

	Average Score	Divide Score by 8
Strategy	45	5.625
Processes	42	5.25
Organisation	38	4.75
Linkages	34	4.25
Learning	37	4.625

In discussing the comparisons between the two companies, each of the five measurements will be used to assess the differences between the perception of innovation in the company following the averages of feedback from employees from both firms are plotted on the graph.

Strategy

The measurement of strategy asked respondents to rate statements made on innovation to assess the innovation strategy used by companies where the following questions assessed perceptions on strategy:

- People have a clear idea how innovation can help us compete
- Our innovation strategy is clearly communicated so everyone knows the targets for improvement
- People know what our distinctive competencies are
- We look ahead in a structured way using tools available
- There is top management support for innovation
- We have processes in place to review new technological or market developments and what they mean

Strategy scored highest for Cleggan Seaweed Company, where Strategy was the second highest score for Rí na Mara. This shows that both companies although operating in different sectors of the natural marine resource economy both have clear innovative strategies that are communicated and understood by staff throughout the company.

Processes

The perception of innovation through processes was measured through the following questions:

- We have processes in place to help us manage new product development effectively from idea to launch
- We systematically search for new product ideas
- Our reward and recognition system supports innovation
- We have a supportive climate for new ideas, people don't have to leave the company
- There is sufficient flexibility in our system for product development

Processes scored second highest for Cleggan Seaweed Company ranking very close to strategy showing innovation is recognised throughout the company through the processes used. Process measurements scored lowest in Rí na Mara and shows a lack of communication in processes, where this element of the business may be perceived by staff as too complicated or may need addressing to communicate the process used and ideas shared throughout the company to increase productivity.

Organisation

The organisational structure was assessed using the following selected questions to obtain the understanding of employee's own perception of their positions within the company and the overall culture of innovation in the company and their relationships with external stakeholders that contribute greatly to the company:

- Our Organisational structure does not stifle innovation but helps it happen
- People are involved in suggesting ideas for improvement to products and processes
- Our Structure helps us to take decisions rapidly
- Communication is effective and works from top down, bottom up...
- We try to develop external networks of people
- We work well in teams

The Organisational Measurement scored highest out of Rí na Mara's scores showing a strong organisational structure that caters for employee's ideas where everyone in the company works well together. As a small company this is often the case in communication throughout the organisational structure according to Tidd and Bessant, 2009. The increased flexibility in decision-making and lower hierarchies of control allow ideas and decisions to flow rapidly and efficiently throughout the business.

This was Cleggan Seaweed Company's third highest measurement showing a strong communication and organisational structure that is effective for a bigger organisation, showing the ability of larger operations to communicate effectively also.

Linkages

Linkages with other stakeholders in the industry can aid and enable your business to develop according to Goffin and Mitchell, 2005. Working with other stakeholders can benefit the company through knowledge transfer and even new idea generation through customer demands or stakeholder requirements. In assessing the linkages in natural resource companies the following questions were developed:

- We have a “win-win” relationship with our suppliers
- We are good at understanding the needs of customers and users
- We work well with universities and other research centres to help us develop our knowledge
- We work well with customers in exploring and developing new concepts
- We collaborate with other firms to develop new products and processes

Linkages was Cleggan Seaweed Company’s lowest score however it was still above average when plotted on the graph showing some improvements may be needed or greater synergies could be achieved for the company through enhanced communication and cooperation with stakeholders in industry.

Rí na Mara scored linkages as their second lowest measurement showing also further improvements needed in this area where stakeholders should be utilised to avail of further industry experience, contribution and expertise.

Learning

The Measurement of Learning is an important factor in knowledge transfer and capturing knowledge in industry that is a vital part of creating a knowledge economy according to the WDC, 2010. Reviewing processes and reassessing the business position is a vital element of innovation with the following questions undertaken:

- We take time to review projects to improve performance next time
- We learn from our mistakes
- We systematically compare our products and processes with other firms
- We are good at learning from other organisations

Learning ranked well for Cleggan Seaweed Company showing recognised systems for reviewing projects and innovative elements in the organisation for reassessing the business needs. This should be continual and done on an ongoing basis throughout the business.

Rí na Mara was below average for this measurement showing vital improvements needed to be made in the area of learning. Although the company may be doing well a false perception could occur where employees feel “they can do no wrong” leading to a false sense of comfort that may hinder innovation.

Strategy and Organisation ranked the highest in measurements in both forms displaying results of strong company strategies in both companies and flexible organisational structures that cater for innovation and allow it to infiltrate throughout the entire organisation. Where Processes ranked high also for Cleggan Seaweed Company, however ranked lowest for Rí na Mara along with linkages and learning in the company. The following recommendations have been made to the companies, with particular points made for Rí na Mara.

6.4 Recommendations

- Innovation in processes should be examined in Rí na Mara to develop communications and knowledge transfer in processes. New product development needs to be the priority of all staff members not just Deirdre the company director. The introduction of a reward and recognition system such as employee of the month or sales targets should be set for staff members in order to create a more supportive climate for new ideas. Without idea generation innovation will lack further in processes.
- Cleggan Seaweed Company are performing well in terms of high levels of innovation calculated across all of the measurements. The company should reassess looking at areas that ranked lower in an attempt to see if there are improvements if any to be made.
- Both companies should continue doing what they are well with their innovation strategy and organisational communications structure. Maintaining high levels of communication throughout the company is essential with flexible hierarchies of control allowing innovation to develop and enhance overall operations.
- Increasing Learning and Linkages should be incrementally improved in both companies on an ongoing basis. Utilising our natural resources is not sufficient if knowledge is lost or not shared with other members of the marine industry's community or if outside research is not shared with relevant companies. Encouraged learning and knowledge transfer with stakeholders in the industry will increase idea generation and create new opportunities for a sustainable future.

6.5 Conclusion

Innovation can be found throughout different measurements in both companies and although many companies strive to maintain increased levels of innovations in all departments across various sections of the business, it is often difficult to have a high score in all areas. This variation in scores provides a vital tool in capturing knowledge for improvements in innovation. Where companies thought they were doing well may not be perceived by everyone else in the company as such, this therefore presents the opportunity to address problems and improve the overall company.

The following chapter offers a final concluding discussion on the overall thesis and research undertaken in offering the main points from research to be discussed by the researcher in a final assessment of innovation through natural resources in the West of Ireland.

Chapter Seven

Conclusion

7.1 Discussion and Conclusion

The previous chapter completed one of the last stages of the research process in generating findings from research, in completing the final thesis report this chapter provides a discussion on research carried out and on the overall topic on Innovation through natural resources. The topic of Innovation has guided the structure of research and the selection of research methods in order to provide a comprehensive analysis of research and data collection undertaken.

In meeting overall research objectives, the objectives set will be discussed before discussing research questions developed in the research methodology.

Research Objectives

The following research objectives were set in conducting the research:

- Identify innovative natural resource companies operating in the West of Ireland
- Review necessary literature available on topic of Innovation in the West coast of Ireland to identify gaps and develop research analysis
- Develop a Case Study for analysis on a company operating in the Western Region
- Compare innovations used through an Innovation Audit

Natural resource companies operating in the marine sector in the West of Ireland were identified with a total of 35 companies contacted for research development. The natural resource companies were termed innovative due to publications in newspapers, in the media and through their own company literature. In identifying the innovations used by companies, the literature review provided a profile of the Western Region and highlighted an abundance of natural resources available in the region.

The opportunities natural resources provide the local economy is greatly under utilised, where the development of the resource through innovation in developing new products and new businesses provides an opportunity for sustainable development of these regions for the future. Galway City and County, where sustainable innovative strategies in relation to the development and utilisation of natural resources in the region are sustained, should further promote the development of natural marine resources in rural Gaeltacht and Island areas.

The types of Innovations used by companies should be defined in each company to ensure the broad and complex nature of Innovation is included in every aspect in business. The use of both incremental and radical innovation is recommended by the author and also recommended by theorists as businesses usually display elements of both Innovations. As innovation is often associated with technology and commercial success, the case study found additional forms of innovation dependant on leaders in the business.

Completion of the Case Study provided a comprehensive contextual analysis of the topic of Innovation of a natural marine resource company operating in the West of Ireland. Innovation was found through product innovation and research and development in the case study. The extensive range of high quality natural seaweed based cosmetics developed in Spiddal; highlight the benefits of utilising this natural resource in the region, where the company has positioned itself for growth and expansion to international markets in America and Australia.

Issues raised during the case study required further investigation to get a true picture of Innovation in the company with a comparison made with another marine resource company operating in the Gaeltacht, Cleggan Seaweed Company. The innovation audit assessed the two businesses through a series of questions that measured innovation in five areas of business: Strategy, Processes, Organisation, Linkages and Learning.

After findings were formulated and plotted along the Innovation audit graph, clear gaps in Innovation were highlighted for the case study company Rí na Mara. Although they are an innovative company in the area of new product developments and continuous research and development, their Strategy and Organisational Structure are strong and well communicated throughout the entire organisation, however the lack of Innovation calculated from employee's perceptions in the three other key measurements of Processes, Linkages and Learning provides a new dimension to research carried out to question the true innovativeness of all elements of the business. Cleggan Seaweed Company had a balanced score in all measures with recommendations given on assessing areas of lower scoring as a point for continual improvement.

Although recommendations were given for Rí na Mara, they additionally can be applied to the natural marine resource industry in the West of Ireland as areas to be measured to ensure knowledge transfer and cooperation between industry members and organisations in the overall utilisation of our natural resources in an attempt to revive the lagging economy.

Capturing learning is difficult, but use of resource tools available such as Innovation Audits, benefited the researchers final findings and provided a truer assessment of overall research on the company. The author for use in the development in research recommends the use of qualitative and quantitative research and although it is highly relevant in assessing the complex topic of Innovation, the use of both methods should not be eliminated in other research topics.

It is clear research objective have been met, however further scope exists for additional research to be carried out in the area of natural resources in continually promoting our national heritage and resource yielding environment.

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Appendices

Appendix One

Pictures of Galway

Profile of Galway Pictures

Lettermore, County Galway



Renvyle, Connemara



Kylemore, Connemara



Inverin, Connemara



Silverstrand



Galway City



Volvo Ocean Race Galway City



Cleggan



Shark Island Cleggan



Inishbofin



Rosadillisk Cleggan



Rosaveel



Appendix Two

Map of Ireland

Appendix Three
Survey Monkey
Audit

Research Request - G.M.I.T

From: MARY DELANEY

To: michael@toweraqua.com

BC:

Date: Thursday - August 12, 2010 5:58 PM

Subject: Research Request - G.M.I.T

Tower Aqua Products

Lickbarrahan

Cahermore

Co. Cork

12 August 2010

Dear Mr O Neill

I wish to enquire if your company would be willing to partake in a survey as part of my research for Masters in Business Strategy and Innovation Management, at Galway-Mayo Institute of Technology. I currently wish to compare innovations in your company with Cleggan Seaweed Company in Connemara, through an Innovation Audit.

Below is a link to the survey if the company is willing to participate, and understand if you are not interested at this point.

<http://www.surveymonkey.com/s/BPBZMMX>

I appreciate your time taken to read this email and would be grateful for any assistance offered.

Yours sincerely

Mary T Delaney

Note: Information given by the company will not be published without the company's consent, and any data obtained can be sent with findings and comparisons to your company.

Innovation Audit

[Exit this survey](#)

1. Innovation Audit

As part of Masters Thesis in **Business Strategy and Innovation Management** at GMIT, the research seeks to investigate innovation in **natural resource companies** along the Western Seaboard and **assess** innovation within companies.

I would be grateful if you could complete the following list of questions in the default section of pages, which should take 3-5 minutes to complete.

[Next](#)

Innovation Audit

2. Default Section

1. People have a clear idea of how innovation can help us compete

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

2. We have processes in place to help us manage new product development effectively from idea to launch

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

3. Our organisational structure does not stifle innovation but helps it to happen

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

4. We have a good "win-win" relationship with our suppliers

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

5. Our innovation strategy is clearly communicated so everyone knows the targets for improvement

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

6. We take time to review our projects to improve our performance next time

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

7. We are good at understanding the needs of our customers/end users

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

8. People know what our distinctive competence is - what gives us a competitive edge

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

9. People are involved in suggesting ideas for improvements to products or processes

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

10. We work well with universities and other research centres to help us develop our knowledge

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

11. We learn from our mistakes

- 1 = Not True
- 2 = Slightly True
- 3 = Average

- 4 = True
- 5 = Very True

12. We look ahead in a structured way (using forecasting tools and techniques) to try and imagine future threats and opportunities

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

13. Our structure helps us to take decisions rapidly

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

14. We work closely with our customers in exploring and developing new concepts

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

15. We systematically compare our products and processes with other firms

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

16. We systematically search for new product ideas

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

17. Communication is effective and works top-down, bottom-up and across the company

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

18. We collaborate with other firms to develop new products or processes

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

19. There is top management commitment and support for innovation

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

20. Our reward and recognition system supports innovation

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

21. We try to develop external networks of people who can help us, e.g. with specialist knowledge

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

22. We have processes in place to review new technological or market developments and what they mean for our firms strategy

- 1 = Not True
- 2 = Slightly True

- 3 = Average
- 4 = True
- 5 = Very True

23. We have a supportive climate for new ideas - people don't have to leave the organisation to make them happen

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

24. We are good at learning from other organisations

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

25. There is sufficient flexibility in our system for product development to allow small "fast track" projects to happen

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

26. We work well in teams

- 1 = Not True
- 2 = Slightly True
- 3 = Average
- 4 = True
- 5 = Very True

Prev Done

How well do we manage innovation?

This simple self-assessment tool focuses attention on some of the important areas of innovation management. Below you will find statements which describe 'the way we do things around here' - the pattern of behaviour which describes how the organization handles the question of innovation. For each statement simply put a score between

Statement

Score (1 = Not true at all to 7 = Very true)

1 People have a clear idea of how innovation can help us compete

2 We have processes in place to help us manage new product development effectively from idea to launch

Reset

Submit

Click on **Score** to calculate the totals for each dimension

Click on **Plot** to plot a profile for the five dimensions

Score

Plot

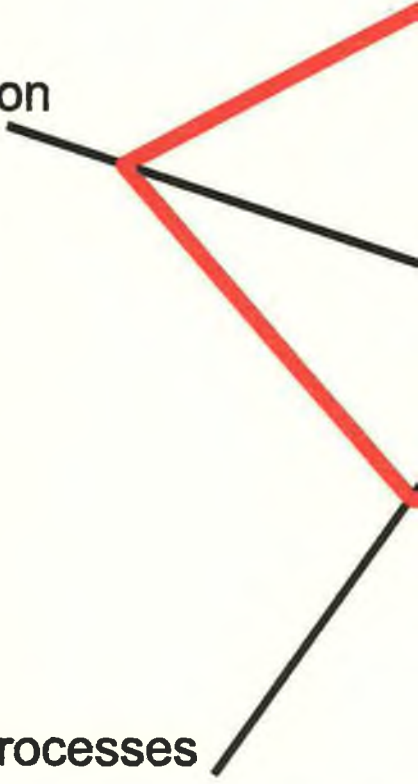
How well do we manage innovation?

Innovative Audit

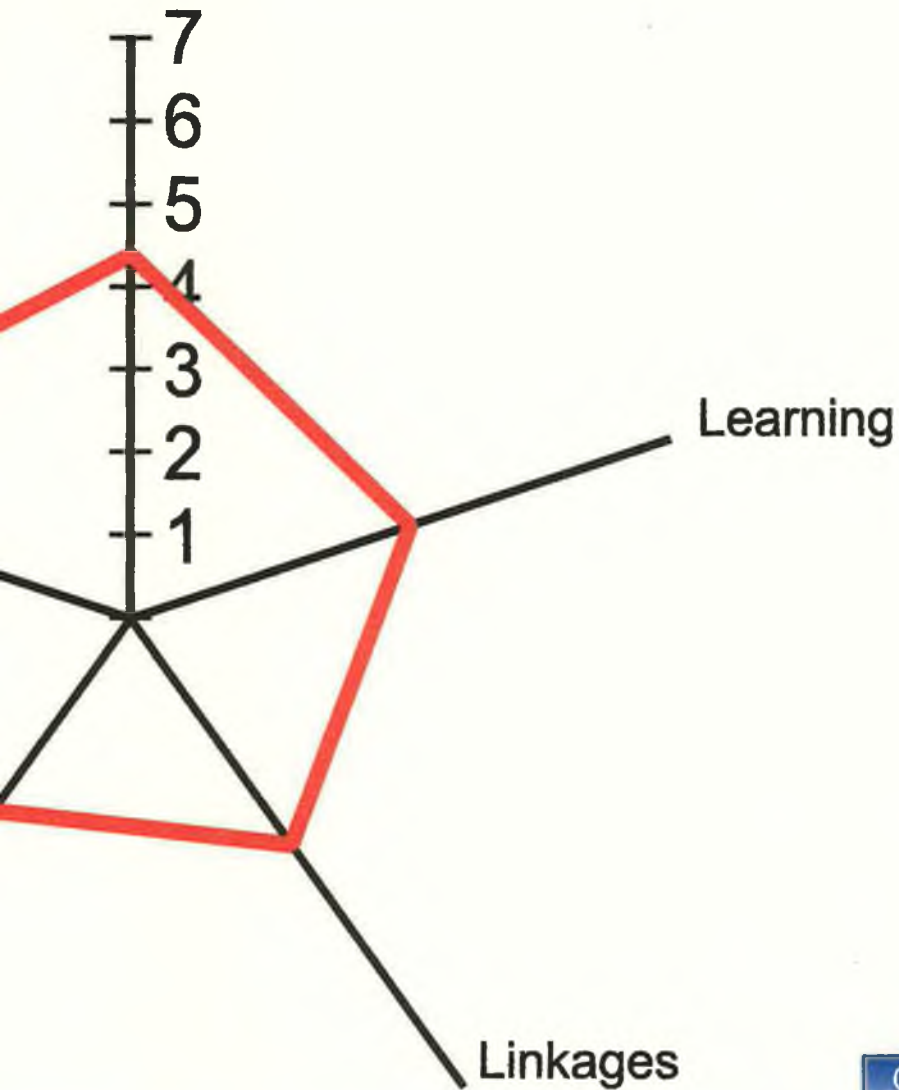
Rí na Mara

Innovative Organisation

Processes



Strategy



Close

How well do we manage innovation?

Innovative Audit

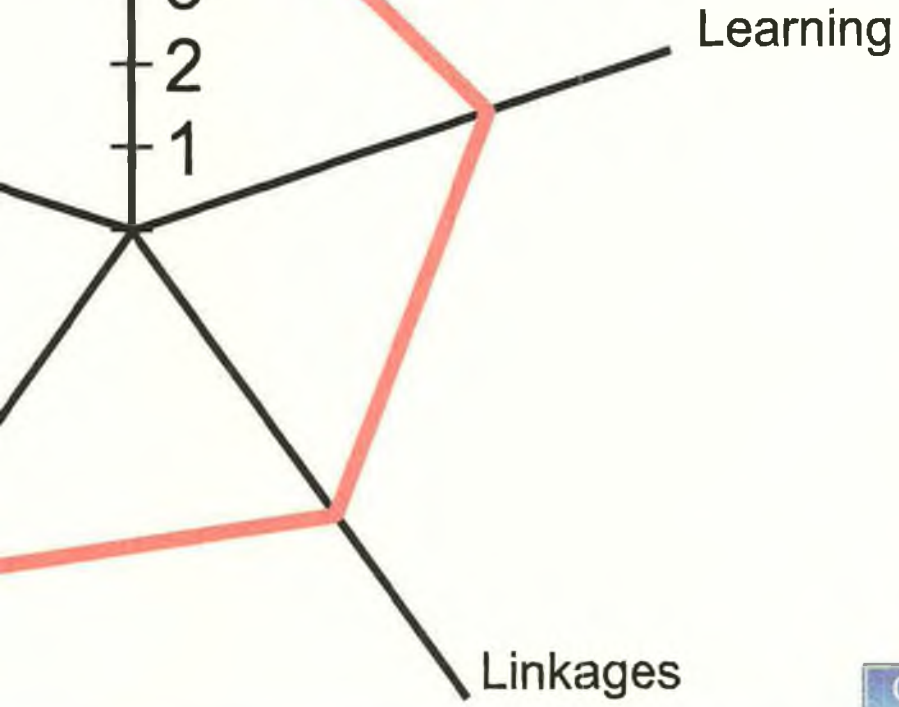
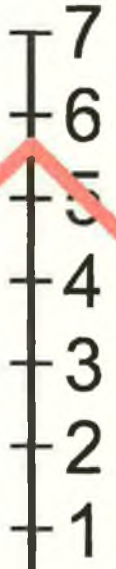
Cleggan Seaweed Company

Innovative Organisation

Processes



Strategy



Close