"Capturing and Identifying Customer Value in a B2B environment"

A case from Norwegian oil and gas Asset Integrity Service Providers

SUMMARY

Knowing customers, their needs, preferences and requirement is one of the prime objectives for any service company. Still, these concepts lack emphasis in a B2B environment. This research presents results from survey conducted with both Norwegian Asset Integrity Service providers and their customers. Customers' insights can provide useful input to improving business models and strategic decision-making to become more attractive, competitive and sustainable in the market.

Jawad Raza

May, 2017

Universitetet i Stavanger

Universitetet
i Stavanger

Master Thesis - Executive MBA

Study Program:	Spring Semester 2017
Executive Masters in Business Administration Program	Open

Title:

Capturing and identifying Customer Value in a B2B environment.

A case from Norwegian Oil and Gas Asset Integrity Service Providers

Author		**Supervisor**
Student Number:	**Name:**	Associate Professor: Thomas Laudal Business School, University of Stavanger, Norway
892250	Jawad Raza ……	

Key words: Asset Integrity Services Business Model, Customer Value assessment, Price & Quality Perception, Sustainability and Competitive advantage	Total no. of Pages. 94
	Stavanger, 22.05.2017

"THE MOST COMPLETE GIFT OF GOD IS A LIFE BASED ON KNOWLEDGE"

Ali Ibn Abi Talib (as)

Contents

Preface

Asset Integrity is a hardcore engineering environment, led by experts and excellent engineers. My motive for this research was to be able to see it from a business perspective. The idea for this research came from years of working experience in several Asset Integrity projects. Combining engineering skills with business understanding helps making better strategic business decision that, in most cases, are not very well understood by engineers. My strong belief is that knowing customer needs, innovative business models followed by strategies are the key to profitable and sustainable AI business.

Abstract

Without suitable business model and strategies, companies have tough time surviving and sustaining in any market. Customer value is a corner stone in most businesses. Customer needs are dynamic, changing from time to time due to different reasons (market, price, quality etc.). This research attempts to capture and identify customer value in a Business-to-Business (B2B) environment focusing on Norwegian Asset Integrity (AI) Service Provider Industry. An online questionnaire survey is prepared to collect feedback from the AI experts affiliated with key Norwegian service providers and customers. Identified perception gaps are highlighted related with customer value, alignment, managing, communicating and delivering it. Many interesting trends and preferences can be seen on the use of networking channels, quality, price perceptions, relationship and creation of value. Most findings relate to the AI business models. This study is the one of the first attempts to explore the concept of customer value and its understanding in AI B2B scenario and can be taken as benchmark for any future researches.

Acknowledgements

An exciting journey of two and half years ends with submission of this thesis. It would have never been possible without support from excellent people around me. I would like to start from my biggest support and my better half, my wife, Aneela Syed. Despite a tough schedule at home with our three beautiful daughters (Tehrim 9, Mariam 7, and baby Kisa, 9 months), she supported my decision for taking Executive MBA also ensured all peace of mind and comfort I needed to fulfill my commitment. I am looking forward to spend more time with my family, trying to recover the time, which I had to sacrifice due to my studies.

Priceless thanks to my mother (Najma Raza), whose blessings are a miraculous support in my life and my career. My brothers (Dr. Ali Raza and Hamad Raza) my sister (Sadaf Rizvi) and families for their moral support. Last but not the least, my father in-law Syed Zahid Hussain and Uncle Hasnain Naqvi, for their countless blessings and encouragement that kept med motivated and make me feel proud on my accomplishments.

Special thank Apply Sørco AS especially my manager Mr. Agnar Kongshaug for the trust, freedom and full support for completing the EMBA program. Thanks to my all MBA classmates and my colleagues including Kristian Helland and Jan Hoel for discussions and support.

Thanks to my Supervisor Associate Professor Thomas Laudal for his critics, constructive feedback and excellent supervision. Thanks to all my teachers from MBA program and all others whom have taught me whatever I know today. A special thanks to all the survey participants who took their precious time to provide their kind feedback.

I am thankful to the most greatest and merciful, Allah, who has been so kind to me. I dedicate this work to my spiritual mentor and inspiration, my beloved father, Syed Sibtain Raza Naqvi (late), who must be feeling proud in the heaven on my accomplishment.

Terms, definitions and abbreviations

Asset is a physical item or entity that has potential or actual value for an organization (ISO, 2014)

Asset Integrity Management is the development, implementation and execution of a coordinated plan together with managerial control and organizational activities, to ensure that the physical asset is performing its intended function in a safe, effective and efficient manner over its entire lifecycle, in order to achieve the organizational objectives (Kusumawardhani, Kumar, & Tore, 2016)

Business-to-business (B2B) refers to a situation where one business makes a commercial transaction with another (Wikipedia, 2017)

Business-level Strategy is about how the individual businesses should compete in their particular markets (business-level strategy is often called as competitive strategy) (Johnson, Whittington, Regner, Scholes, & Angwin, 2014)

Customer is a party that receives or consumes products (goods or services) and has the ability to choose between different products and suppliers. In this context, Customer is referred as buyer of Norwegian Asset Integrity (AI) Services and Products.

Customer Relationship Management (CRM) is the plan and system that a business has for dealing with customers over a period of time: Customer relationship management aims to attract and retain customers in a cost-effective way.

Customer Satisfaction is a measure of how happy customers feel when they do business with a company.

Customer Loyalty is likelihood of previous customers to continue to buy from a specific organization.

Diversification increasing the range of products or markets served by an organization (Johnson et al., 2014).

Service is a valuable action, deed, or effort performed to satisfy a need or to fulfill a demand. According to American Marketing Association (AMA), Service "is activities, benefits or satisfactions which are offered for sale, or are provided in connection with the sale of goods''

Strategy is a long-term direction of an organization. (Johnson et al., 2014)

Modification is a combination of all technical, administrative and management measures intended to change one or more functions on a unit/system (NS-EN13306, 2010)

Quality is superiority or excellence of a product or service. Perceived quality is the consumer's judgment about a product's overall excellence or superiority (Zeithaml, 1988).

Qualitative research is method of inquiry employed in academic discipline like social and natural sciences, market research and business.

Quantitative research is Empirical investigations mathematical and statistical analysis to develop theories and/or hypothesis.

Surveys: Asking questions of a target population (or a sample of it) and analyzing the responses in order to generate information.

Sustainability is concerned with assessing which proposed strategies address the key opportunities & constraints an organization faces.

Service and supply industry in this context are the companies that supply oil- and gas-related products and services to the upstream oil and gas industry (excluding hotel, transportation, office, property and telecommunication services).

List of Abbreviations

AI	Asset Integrity
AIM	Asset Integrity Management
ASQ	American Society of Quality
BM	Business Model
CEO	Chief Executive Officer
CLV	Customer Lifetime Value
CV	Customer Value
EMBA	Executive Masters in Business Administration (UiS study)
EPCIC	Engineering, Procurement, Construction, Installation and Commissioning
FEED	Front End Engineering Design
HSE	Health, Safety and Environment
HSE&Q	Health, Safety, Environment and Quality
ICT	Information and Communication Technology
IOT	Internet of Things
LCC	Life Cycle Cost
MMO	Maintenance, Modification and Operation
NCS	Norwegian Continental Shelf
NOK	Norwegian Crowns (Norwegian Currency)
NPD	Norwegian Petroleum Directorate
OEM	Original Equipment Manufacturer
O&M	Operation and Maintenance
O&G	Oil and Gas
QMS	Quality Management System
PSA	Norwegian Petroleum Safety Authority
R&D	Research and Development
RBI	Risk-Based Inspection (AI Service for static equipment)
SWOT	Strengths, Weakness, Opportunity & Threats (analysis)
UiS	University of Stavanger
VRIO	Value, Rarity, Imitability and Organization (analysis)

Key Words

Business Model, Customer Value assessment, Asset Integrity Service Provider Industry, B2B Services, Price & Quality Perception, innovation, sustainability

Structure of the report

The report includes 11 chapters.

Chapter 1: Introduces motive and importance of the research

Chapter 2: Presents a brief introduction to Norwegian Asset Integrity Service Provider Industry. It also includes current reflections on oil and gas market situation associated with Asset Integrity Industry.

Chapter 3: Presents conceptual tool for business modeling for AI Service Provider Industry.

Chapter 4: Describes main research objectives, methodology the limitations.

Chapter 5: Gives an overview of relevant literature cited during the research and presents a brief summary of the literature at the end of the chapter.

Chapter 6: Presents that trends and preferences, as seen in the collected data from both industries

Chapter 7: Highlight findings in term of consensus and perception gaps between the two industries

Chapter 8: Concludes the outcome of the research

Chapter 9: Suggests what can be done for future research

Chapter 10 includes references and **Chapter 11** appendices.

1 Introduction

Due to squeezed margins and tough competition in global Oil and Gas (O&G) sector, the Norwegian Asset Integrity (AI) Service Provider Industry is in a serious "thought process" of how to survive the fierce competition, thereby becoming more attractive and competitive in the market. This has led many organizations to think "out of the box" on how to innovate their business models to create additional value for their Customers. Norwegian AI industry, as of today, heavily relies on the O&G market. The management needs to understand Customer value their requirements, expectations and future needs. Recently, in the Norwegian market, we see many mergers, fusions and acquisitions to increase the competitive strength, sustainability and growth (organic and inorganic). The organizations that failed to survive may face serious consequences like losing income, profitability and even danger of bankruptcy. All organizations have models and strategies, in some cases; these evolve from organizational culture and long business experiences. These models and strategies have worked well in a good market, but may need a second thought to cope with fluctuating market challenges. Only good and well-thoughtful business models will survive. This thesis explores concept of customer value in Asset Integrity B2B environment. Customer value is a central theme in any business model and can be a roadmap to robust and sustainable business strategies. It is important to understand the AI business environment and current AI market challenges.

2 Norwegian Asset Integrity (AI) Market

Asset Integrity (AI) tasks are vital for retaining safety, productivity and efficiency of the offshore assets. Poor integrity can contribute to complete or partial loss of asset resulting in endangering human life, environmental damage and huge financial losses. A recent example is the loss of an offshore drilling rig in 2010, Macondo that caused British Petroleum (BP) Company about 10 billion € (i.e. 84 billion NOK) (Wikipedia, 2017). The AI services aim to safeguard against such risks and unwanted outcomes.

Operation and Maintenance (O&M) is a vital role in retaining integrity of any asset. These activities are also a major contributor to a plant's expenditures. European industry spends about 600 Billion €/ year (ca. 5 trillion NOK) maintaining their industrial assets (Maintworld, 2016). In Norway, about 6 Billion € i.e. ca. 60 Billion NOK[1] is spent on operating 80 offshore fields in 2016 (NPD, 2017b). About 38% of the total expenditures in 2016 and 44% in 2015 relate to O&M of the offshore facilities (NPD, 2017b).

Norwegian Petroleum Safety Authority (PSA) has a vital role for supervising all oil and gas activities on the NCS. PSA has imposed a set of regulations (including HSE regulations, emergency response, working environment, operation, maintenance etc.) for all offshore O&G asset owners (including O&G operators and rig owners). All O&G companies operating in NCS operate in compliance to these regulations at all times. PSA conducts regular audits to ensure compliance and follow up of these regulations. PSA's rules and regulations are one of the main drivers of the integrity management activities. Other drivers include cost, productivity and quality.

[1] The operating cost includes day-to-day operation and labour cost for all maintenance and modifications on the asset.

2.1 Norwegian AI Service Provider Industry

Norwegian AI Service Provider Industry is mature, offering their services since the start of the oil adventure in Norway in 1969. There are several companies offering highly competent niche services to their Norwegian Customers. Customer is *"A party that receives or consumes products (goods or services) and has the ability to choose between different products and suppliers"* (Dictionary, 2016). With ageing offshore assets, the demand for these services is continuously rising. Typical AI Services are in form of long-term contractual engagements between Customer and the Service Provider. Maintenance, Modification and Operations (MMO) frame agreements ranging up to 6-8 years duration. The AI services, in general, are divided to the following major categories:

2.1.1 Operations, Maintenance & Inspections

These are engineering services (& products) to operate, maintain and inspect offshore assets. This include provision of skilled workforce (mechanical, electrical and instrument disciplines) and required tools to perform the work. Offshore operations also require support from onshore engineering disciplines to follow up day-to-day operations and maintenance coordination, planning and execution of intended activities. All these services must comply with regulatory requirements and the Company's O&M targets (in terms of safety, economy, availability, quality and productivity). Customer buy or hire these services to run their offshore asset with high safety and integrity.

2.1.2 Small-scale and medium-scale modification projects

Small-scale modifications include component maintenance, simpler upgrades and necessary repairs (such as cleaning and refurbishing etc.). These services also require onshore engineering support in form of procurement, logistics and coordination etc. The economic scale of these modifications depends on the scope and complexity of the upgrades. Customers buy or hire these services to perform safe and cost effective

upgrades to their asset, in compliance with regulatory requirement and company targets.

2.1.3 Larger modification projects and field development

Some modification jobs are more complex requiring extensive planning prior to the execution. Such modifications may require hundreds of resources at a time resulting in multi-billion projects. Such projects are usually major revenue generator for the AI Service Provider organizations. Such modifications may also need new concept development, design and feasibility studies (known as FEED i.e. Front End Engineering Design) prior to the execution. Due to complexity and scale of the scope, these services may include engineering, fabrication, construction and installation activities (known as EPCIC i.e. Engineering, Procurement, Construction, Installation and Commissioning contracts). Depending on the size and competences of an AI Service provider, there may be a need for alliance with external suppliers (sub-suppliers) and equipment manufacturers. Customers buy these services to perform larger upgrades to their asset, in compliance with regulatory requirement and company targets. Some general reasons, why Customers hire the AI services include:

- Complex problem solving
- Getting experts to do the job with high safety integrity and quality
- Compensating the lack of internal capacity or competences and
- Lower costs (outsourcing vs. developing in-house competences) etc.

2.2 O&G Market Challenges

Economic recessions and financial crisis has struck business the world in the past and will continue to do so in the future. An example is the financial crisis of 2007-2008, also known as global financial crisis (Wikipedia 2017), started from collapse of banks hitting housing market, slowing down economic growth resulting in millions of lost jobs. The

course of O&G business is known as roller coaster ride, reaching steep heights, sharp turns and deep dives. Figure 1 shows global oil price variation in past 5 years.

Norway is 8th largest exporter of crude oil and 3rd largest Gas exporter (NPD, 2017a). The export of oil contributes to 2% of global oil consumption whereas the export gas fulfills up to 20% of EU's gas demands.

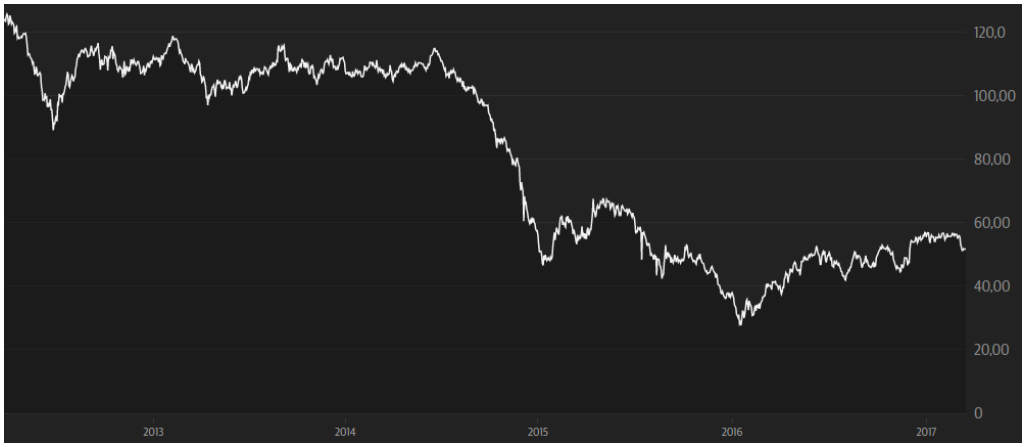

Figure 1. Oil prices past 5 years (Source: https://investor.dn.no)

The Norwegian O&G industry is a major contributor to country's economy. Norwegian Petroleum Directorate confirms that this is the largest business sector in terms of value added, government revenue, investments and export value (NPD, 2016). In 2015 O&G sector generated about 18 billion € ≈ 169 billion NOK (Haugan, 2017). Oil prices hitting down to $30 per barrel pushed the O&G industry to its limits. This led to major restructuring and reforms in both Service providers' and Operators' organizations. The whole industry is undergoing a lot of organizational and management changes. In Norway, services and supplier industry (in general) is second-largest industry including more than 1100 companies (NPD, 2017c). Among these 1100 companies, most relate directly or indirectly to the O&G industry.

3 AI Service Providers' Business Model

Most organizations have a (formal or informal) model of doing business based on which strategic decisions are based. In this thesis, these are referred to as a "*Business Model"* (BM), and "*Business-level Strategies*". BM is "*a conceptual tool containing a set of objects, concepts and their relationships with the objective to express the business logic of a specific firm*" (Osterwalder, Pigneur, & Tucci, 2005). Whereas strategy, is a long-term direction of an organization (Johnson et al., 2014). *Business Model* describes how an organization manages income and cost of its activities whereas *business-level strategy* describes how an individual business competes in its particular market (Johnson et al., 2014). It is a conceptual, rather than financial, model of any business (Teece, 2010). Business models are more generic, coupling many business elements together.

Levitt (1960), in his excellent article, presented the view of industry as a customer-satisfying process, not a goods-producing process that is vital for all businesspersons to understand. It starts with customer needs, not patent and raw material or selling skills. The industry develops backwards, according to customer needs, by delivering customer satisfaction and creating the things by which these satisfactions are achieved (Levitt, 1960). The business strategy selected by an organization should meet both profitability targets as well as customer requirements.

In this thesis, the AI Service industry is considered as a customer-satisfying industry. To investigate the business model of AI Service Provider industry, business model canvas proposed by Osterwalder and Pigneur (2010) is used. The reason for selecting Osterwalder business canvas is its visual representation, ease of use, conceptual modelling processes and focus on Customers. Which is quite relevant in the case of AI Service Provider Industry. Based on the own experience working in AI organization and research, the generic business model for AI Service

Provider is provided in Figure 2. The business model for is based market research and own experience from AI Service Provider Industry. This expresses a generic conceptual “as-is” Model, and not to be misunderstood as representative for a single AI Service Provider. However, the concept is open and can be adopted by any AI organization, whomever finds it relevant and interesting.

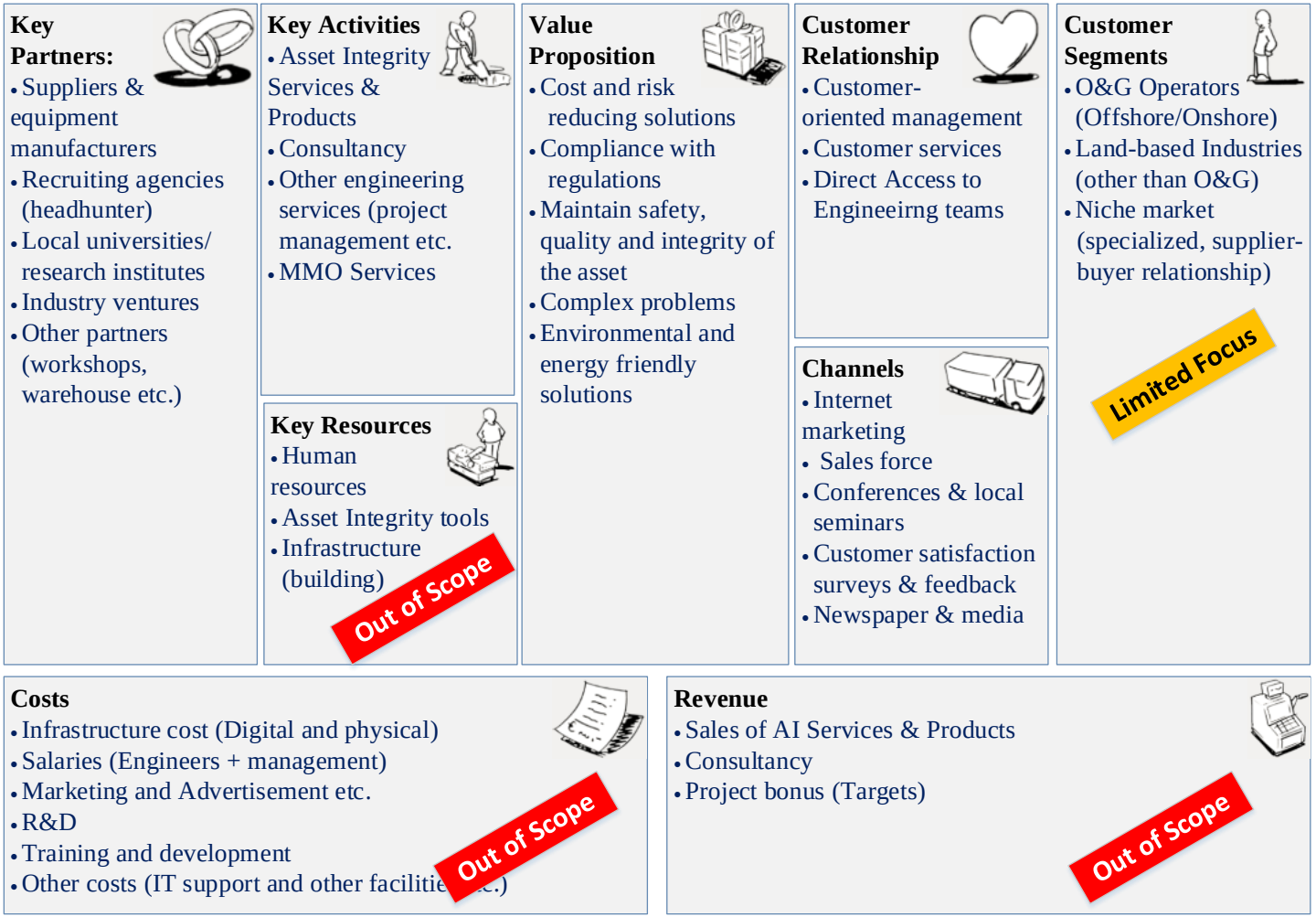

Figure 2. Generic Asset Integrity Service Providers' Business Model[2]

[2] *Business model canvas template taken from (Osterwalder & Pigneur, 2010)*

The Osterwalder's business model canvas comprises of nine building blocks. This concept focuses on delivering and managing value creation and proposition in the AI B2B environment. Financial part (Revenue and cost), competences and infrastructure (Key Resources) are not included at this stage of the research. The reason being focus of research on Customer value and not profitability.

Brief description of 9 building blocks in a business model is as follows (Osterwalder & Pigneur, 2010):

1. **Key Partners** describe the network of suppliers and partners that make the business model work. In AI business, the service provider may establish strategic partnerships and alliances, with third parties, to compensate any lack of competences (or facilities) or resources.
2. **Key Activities** describes the most important things a company must perform to make its business model work. Key activities for AI Service Provider are mainly engineering services such as consultancy and MMO services and products.
3. **Value Propositions** describes the bundle of products and services that create value for a specific Customer Segment. AI Service provider deliver value in terms of cost and risk reducing solutions, compliance with regulations, maintaining safety integrity and quality by solving Customer's complex technical problems.
4. **Customer Relationship** describes the types of relationships a company establishes with specific Customer Segment. Customer has a key role in AI Service Provider industry. AI Services Industry focus on being highly customer-oriented and aims to keep a strong relationship with their Customers. It requires efforts from management as well as engineering teams working on assigned AI projects.

5. **Channels** describes how a company communicates with and reaches its Customer Segments to deliver a Value Proposition. These are *"Customer touch points"* are vital lifeline for AI Service Providers. AI Service Providers use different means to reach their Customers including e-channels (i.e. World Wide Web, www), direct sales/marketing meetings, seminars, advertisements and Customer satisfaction surveys etc.
6. **Customer Segment** defines the different groups of people or organization an enterprise aims to reach and serve. For most Norwegian AI Service Providers, main customer segment includes offshore O&G Operators. Some may have customers in other markets including land-based industries, manufacturing etc. This building block has a limited focus throughout this research.
7. **Key Resources**[3] describes the most important assets required to make a business model work. Competent staff, tools (applications) and infrastructure etc.
8. **Revenue**[3] represents the cash a company generates from each Customer Segment by selling their services and products.
9. **Costs**[3] describes all costs incurred to operate a business model. It includes all cost such as salaries, administration, management, facilities, training, Research and Development (R&D) etc. that are required to perform key activities.

AI business is heavily relying on the Customers. Identifying Customer value delivering and managing it, are key to a sustainable business. Higher Customer-orientation is required for future growth and development of new products or services. Challenges related with customer value include quality issues, pricing, misunderstanding, communication gap, misinterpretation of requirements, misalignment etc. Most of these issues directly relate to the building blocks of the

[3] *Not included in scope of the research.*

generic business model presented in Figure 2. A business research is required to explore these issues in complex AI B2B environment.

4 Research objectives, methodology and limitations

Identifying customers and their requirements, acquiring information about how they experience the services (and products), capturing growth opportunities and developing strong relationship may require in depth research. Successful businesses depend on good research and interpretation of empirical evidence. In a B2B context, understanding complex things through social interaction or human behavior is not easy. Without empirical scientific approach to develop knowledge, our understanding will be incomplete (Weathington, Cunningham, & Pittenger, 2012). Business research needs clear purpose, objectives and methodologies to solve the market challenges. Next section defines the main objectives of the AI business research.

4.1 Research objectives

The purpose of this study is to contribute to the increased understanding and practical implication of business model for AI Service Provider in a B2B environment. It attempts to identify opportunities in this business model to create, identify and capture value to become competitive enabling a more sustainable growth. Higher perceived value is essential to achieve excellence in the AI market. Following are main research questions that this research seeks to answer, related to different building blocks of the generic AI Business model, presented in Figure 2, Section 3.

Value proposition:

1. How the knowledge about customer value used by AI Service provider to become more competitive, sustainable and efficient?
2. How to assess customer value perception in an AI B2B environment i.e. the worth of AI Products and services in the eye of Customer?
3. Are Customer's values aligned with their AI Service Providers?

Customer Relationship:

4. How willing are both industries in co-creating value? (With support from the third parties, e.g. service providers, suppliers, sub-suppliers, competitors etc.)?
5. Is the AI Service provider industry customer-oriented? i.e. Customers are considered as a key asset, their values integrated with rest of the business model.
6. What are the gaps between the two businesses (in terms of quality & price perception, innovation and communication in long-term relationship etc.)?

Channels:

7. What are the preferable e-channels Customers want to be reached?
8. How well the Customers are aware of AI market?

Most of the research questions are not new to the AI Service Provider Industry. However, there is a lack of any industry-wide business research addressing these concepts. The business research method adopted for conducting the research is describe in next section.

4.2 Research Methodology

Business research process in real world is dynamic, multi-dimensional and non-linear process (Greener & Martelli, 2015). It is study in which business data is collected and analyzed to provide input to the decision makers. Good business depends on good research and those who know how to interpret the empirical evidence (Weathington et al., 2012). Assessment of value is not possible without gathering empirical data. For this purpose, a questionnaire survey is selected to collect input from AI Service Provider Industry and Customers' perception about the received services (and products). The empirical data is important to understand individual preferences (as seen in experts from individual industry) and to highlight any perception-gaps between the two industries. Such information can provide quite useful input for strategic business decisions.

Figure 3 shows the business research process adopted in this research study.

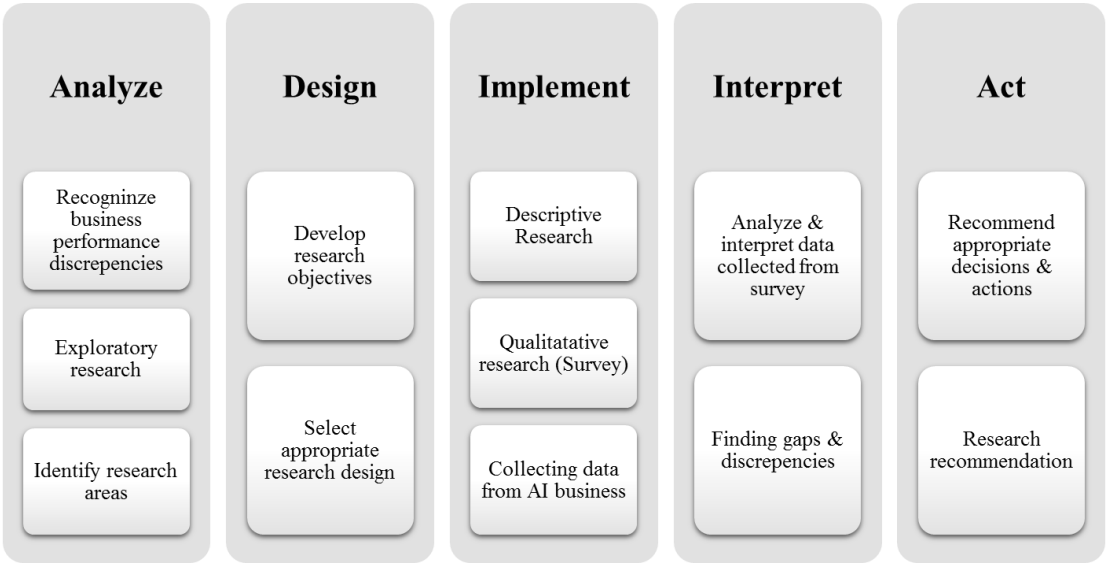

Figure 3. Business Research Process[4]

Library resources from University of Stavanger (Crespo Márquez et al.), books, relevant compendium material from EMBA studies, internet search and google scholar are a prime source for literature search. Exploratory research is necessary to identify and clarify the problem area. The research started with a literature review to understand the issues within the area of interest. To explore research objectives, descriptive research was adopted. Due to lack of available literature, a survey targeting AI Service Providers and the Customers (O&G Operators) is required (Qualitative research method).

A Questionnaire includes questions asking "who", "what", "how" and "how much" type queries. The questions are focusing on contemporary events therefore elements from case study research were utilized in performing the research (Yin, 2003). Two separate questionnaire were prepared, targeting both parties in value creation process i.e. AI Service Providers and Customers (O&G Operator). Questionnaire design is based on the cited literature, experience and personal inference.

[4] *Adapted from (Greener & Martelli, 2015)*

4.2.1 Questionnaire design

The design of the questionnaire is shown in Figure 4. Complete questionnaires are attached in Appendix A of this report.

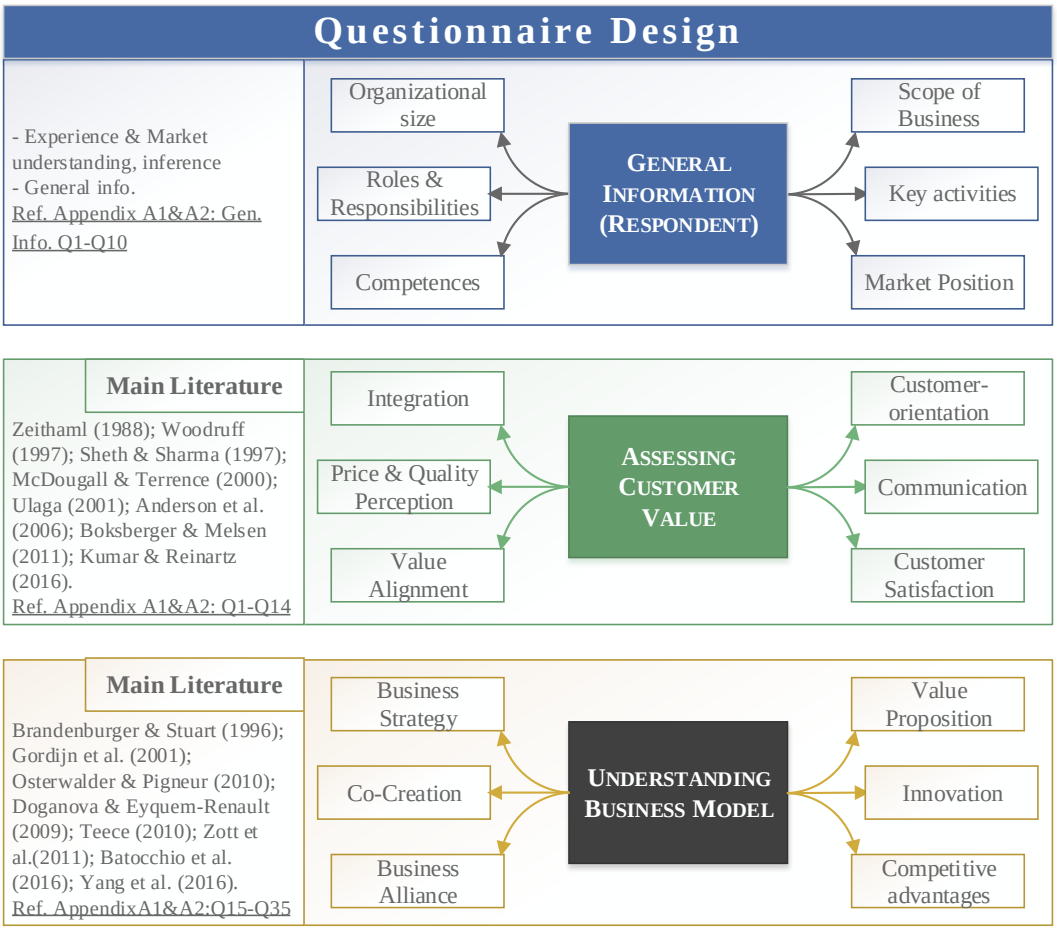

Figure 4. Questionnaire design

All questions were customized to fit the AI environment and the intended research objectives. An online questionnaire survey was prepared using a web-based application, *SurveyXact*. The questions in the questionnaire are divided into three response categories.

1. **Category I:** General information questions (size of organization, qualifications, role, responsibilities etc.), all responses are qualitative.
2. **Category II:** About 70% of the questions are seeking responses in form of level of agreement ranging from Strongly Agree to Strongly Disagree (also known as Likert Scale). This is one of the

most widely used scale used for customer surveys and online questionnaires.

3. **Category III:** Remaining 30% questions are seeking response in terms of multiple "Yes, Maybe, No, and Do not know" options.

In developing the questionnaire, following criteria were taken into consideration (Greener & Martelli, 2015; Lietz, 2010; Vinten, 1994; Yin, 2003):

- All questions must be valid and fair
- The questions have clear objective and relating directly to the need for information
- Formulation of the questions to be non-threatening and non-provoking
- Less use of "Don't know" unless where the respondents may have little or knowledge
- Question are kept simple, short and avoiding complicated sentences
- Unbiased formulation, open to contrary

4.3 Research limitations

Based on professional experience from Norwegian AI Service Provider organization and fair understanding about Norwegian O&G market, the boundary of this research was limited only to the Norwegian industry. The survey is conducted among key Norwegian AI Service Provider and their Customers, excluding other stakeholders such as suppliers and sub-suppliers. The research employs conceptual business modelling tool from (Osterwalder & Pigneur, 2010), other similar business modeling tools are therefore not considered. The research excludes issues related with building blocks "*Key Resources*", "*Costs*" and "*Revenues*" in the business model Canvas (Ref. Section 3, Figure 2). Results presented in the research are based on interpretation of the responses received from 34 experts. 19 experts from AI Service Provider Industry and 15 from Customers (O&G Operators). Moreover, Subsea Integrity Service Providers are not a part of the study.

5 Business theory and concepts

There is extensive literature available addressing the concept of Business model and customer value, delivering value, measuring values and maximizing it (Bei & Chiao, 2006; Boksberger & Melsen, 2011; V. R. Kumar, Werner, 2016; McDougall & Terrence, 2000; Osterwalder & Pigneur, 2010; Osterwalder et al., 2005; Stabell & Fjeldstad, 1998; Woodruff, 1997; Zeithaml, 1988). Many authors acknowledged that the customer value concept in not yet fully developed (Anderson, Jain, & Chintagunta, 1992; Menon, Homburg, & Beutin, 2005; Parasuraman, 1997). A summary of cited literature about the research topics in a B2B environment is provided in the next section.

5.1 Business model

For successful business models, many authors (Doganova & Eyquem-Renault, 2009; Enkel, Gassmann, & Chesbrough, 2009) emphasize on the concept of open innovation where various actors contribute in generation and commercialization of the created value. In practical terms, a business model can work as a device allowing entrepreneurs to explore a market, brining innovation, new ventures and network into existence (Doganova & Eyquem-Renault, 2009). Some of the main reasons for business model failures may include misalignment between value proposition and customer segment, cost and revenue and implementation (Batocchio, Ghezzi, Rangone, & Al-Mashari, 2016). A new business model plot may help organization designing new products, or turn on process innovation making or selling or distributing an already proven product or service (Magretta, 2002). According to Magretta (2002), business models can be considered like stories that explains how an enterprise works.

Osterwalder and Pigneur (2009) describes a business model through nine building blocks. These blocks show logic of how an organization intends to make earning. Such a model provides means of a blue print for a strategy to be implemented through organizational structure, processes

and systems. A business model is a conceptual tool containing a set of objects, concepts and their relationships with the objective to express the business logic of a specific firm. Therefore we must consider which concepts and relationships allow a simplified description and representation of what value is provided to customers, how this is done and with which financial consequences.

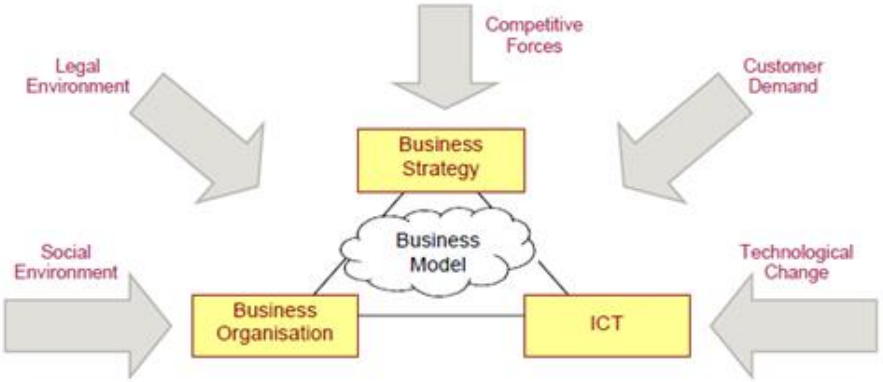

Figure 5. Business model in an organization (Osterwalder et al., 2005)

Figure above shows business triangle showing relationship among strategy, organization and its digital infrastructure (Information and Communication Technologies, ICT). This business environment is subject to several external elements including high customer demand, competitors, technological advancement, legal and social environment. Increasingly demanding customers, cost focus, global competition, high operating costs, marginal profits are some of the factors that are compelling service providers to look for new and innovative business models to sell their services and retain competitive advantage.

5.2 B2B Environment

In business market, value is a trade-off between benefits and sacrifices. Some define value in monetary terms while others use it as a broader concept, including non-monetary values such as competences, market position and social rewards (Walter, Ritter, & Gemünden, 2001). Customer value is the "corner stone" of business marketing management (Menon et al., 2005). In order to deliver better value, this concepts needs to be understood by the service providers. Business is about creating

value where service Provider gets “Customer-generated value” (in terms of money) by selling their products or services. It is of utmost important that these values are aligned. It means that Customers are willing to pay the value they perceive from the services. A balance in price and quality plays an important role in this value chain. A research performed by (V. Kumar & Reinartz, 2016) argues importance of alignment between the customer perceived value and the seller firm’s value. The alignment is dynamic as more knowledge about customer is available. This means that, ideally, Customers should experience an increase in quality (and efficiency) of the services over longer periods. As an example, the quality may change over the time due to competition, changing customer needs, promotional efforts of the companies and as more information available to the Customers (Zeithaml, 1988).

In a B2B environment, the value is different from one party to the other. For example, customer judgment about a service may be different from Service Providers’ claim. Anderson et al. (2006) recommend making customer value proposition a fundamental part of business strategy. The value creation in a B2B is not only associated with the provider, customers must participate the value creation process. Another concept of creating value with active collaboration from customer from beginning of the innovation process is called Co-Creation (Kristensson et al., 2008). It is therefore important to identify the leading customers who may be interested in Co-creation. A robust relationship is therefore mandatory between the involved parties to have satisfied customers and profitable providers (Lapierre, 1997). An important strategy is to nurture the cross-buying behavior from the satisfied customers. From AI Service provider point of view, this cross-selling might not always be profitable, but will strengthen the relationship. More about cross-buying behavior is argued in (V. Kumar & Reinartz, 2016).

5.3 Role of AI Service Provider in value chain

As mentioned in the previous section, all stakeholders benefit from value the created in a value chain. AI Service Provider organization's role in this value creation is shown in Figure 6. A Customer (buyer of AI Services and products) may acquire AI services from multiple Service Providers at a time (for example Subsea integrity services from one Supplier and structural inspection services from another).

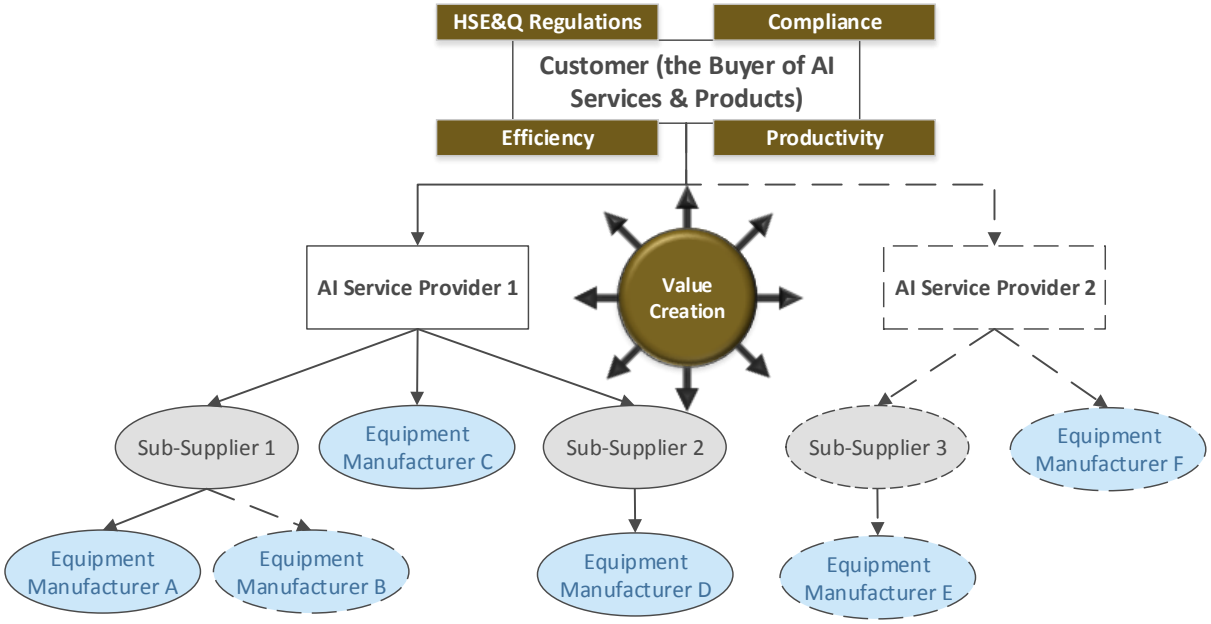

Figure 6. Value chain in Asset Integrity B2B environment

In this Customer-Supplier relationship, value should be created for all stakeholders. The generated value can be either in terms of the satisfaction by purchasing the services or the monetary value by selling the services and products. Value creation is the essential purpose for a customer and a supplier engaging in a relationship and does apply to all involved suppliers (and sub-suppliers) (Walter et al., 2001). In some scenarios, the AI service provider itself buys products and/or services from its sub-suppliers/original equipment manufacturers to fulfil its Customer's demands. For value proposition to its Customer, it is of great importance that AI Service providers understand their customers and their requirements. Some of these requirements may include:

- Compliance with Stringent HSE legislation and quality regulations
- Satisfying Customer-specific Health Safety and Quality (HSE&Q) internal requirements
- Filling competence gaps for Customer
- Increase productivity quality & efficiency of Customers' processes
- Solving Customer's complex problems by providing flexible, efficient, tailor-made and innovative solutions
- Providing high level of control and comfort and ease to the Customer
- Getting the job done for the Customer

As mentioned in earlier sections, tough O&G market is compelling AI industry to look for revolutionary reforms in their business model to be able to provide superior value keeping their profitability. Matching these requirements can be quite challenging.

5.4 Value perception of Customers:

A broader definition of Customer is *"one who uses the product or service, the one who purchases the product or service or the one who influences the product or service"* (Khurram, 2012). Perceived value is defined as "*Customers' net valuation of the perceived benefits accrued from an offering that is based on the costs they are willing to give up for the needs they are seeking to satisfy"* (V. R. Kumar, Werner, 2016). Zeithaml (1988) attempts to define concept of price, quality and value from a consumer's perspective. He states:

- Perceived quality can be defined as the consumer's judgement about product's overall excellence or superiority
- From the consumer's perspective, the price is what is given up or sacrificed to obtain a product
- Concept of perceived value in terms of price, quality and satisfaction (Zeithaml, 1988)

The basic concepts about perceived value, price and quality are quite similar in both consumer (B2C) and business (B2B) markets. Delivering better trade-off between benefits and sacrifices in a product or a service will help an organization to create sustainable competitive advantage (Eggert & Ulaga, 2002). In addition, Customer satisfaction and loyalty depend on the high-perceived value. Figure 7 shows that many other marketing concepts that have a relationship with perceived value.

Societal values	Transaction-specific value	End-state value
Service industry		
Business ethics	Service excellence	Service profit chain
Social corporate responsibility	Service recovery	Relationship marketing
Rules	Value creation	Customer lifetime value
Norms	Pricing	
Individual customer		
Attitude	Service quality	Quality of life
Desired values	Customer satisfaction	Wellbeing
Comparison standards	Consumption values	
Expectation	Perceived value	
	Benefits	
	Sacrifices	

Figure 7. General nature of the perceived value in a service industry (Boksberger & Melsen, 2011)

For service organizations, it is particularly important to differentiate between different types of perceived value (Boksberger & Melsen, 2011). First empirical effort in identifying the relationship between perceived value, customer satisfaction and re-purchase intention in a B2B environment (consultancy) is given in (Patterson & Spreng, 1997). The results confirms a positive relationship and concludes that higher perceived value becomes a competitive advantage for the service organization.

In any business, it is important to understand who the customers are and what their needs are. In AI business market, the most important Customer requirements are compliance to the HSE and Quality regulations and price. One of the main reasons for why customer leave is due to poor or dissatisfaction from services.

5.5 Value proposition by the Service providers

Customer-perceived value needs to be understood to approximate Customers' willingness-to-pay. Kumar and Reinartz (2016) discussed various models for understanding and measuring value for customers. The choice and selection of these models are dependent on availability of data, quality of data and volume. In order to keep the volume and preferably increasing the volume, the service providers' strategy is to nurture their Customers' *cross-buying* behavior. This means enabling existing Customer to buy more products or services from the same firm. Service provider and their customers have a demand-supply relationship. This means that a clear distinction needs to be made between the demand and supply perspective (Boksberger & Melsen, 2011).

Woodruff (1997) stated that more and more managers do not believe that quality and product innovation provide the basis for competitive edge to an organization. At the same time, he emphasizes that managers must translate customer learning into superior performance to become more attractive and competitive. This is not possible without a proper understanding of Customer value and how well this value is delivered to the Customers. In a buyer and seller scenario, the value creation is "willingness-to-pay" of the buyer compared with the "opportunity cost" of the supplier. Willingness-to-pay is always an ingredient in value chain (Brandenburger & Stuart, 1996). It is vital that the opportunity is "realized" and understood by the buyer in order to make the buyer pay for the opportunity. A latest definition of sustainable business is to create value to its customers and to extract some of that customer value in form of profit (V. R. Kumar, Werner, 2016).

Despite several concepts and empirical studies on value, still customer value is a concept that lacks clarity. Understanding customer values captures the result of services, allowing firm to measure its competitive advantage in the eye of customer. Strong focus on customer value have a significant impact on the business market management.

5.6 Value-Based Business Strategy

Strategy is a long-term direction of an organization. The business level strategy is about how the individual businesses should compete in their particular markets (business-level strategy is also known as competitive strategy). These are typically concerned with innovation, appropriate scale and response to competitor's move (Johnson et al., 2014). Johnson *et al.* (2014) explored different aspects of strategy and recommended Michael Porter's *five forces framework* to analyze dynamics of the industry. Porter's five forces framework helps identify the attractiveness of an industry in terms of five competitive forces. These include i) threat of entry ii) threat of substitutes iii) power of buyers iv) power of supplier and v) extent of rivalry between competitors. As a general rule of thumb, where these five forces are high, industries are not attractive to compete. Excessive competition, powerful buyers and suppliers and threat of new entrants will all combine to squeeze profitability.

The power of Porter's five forces changes with different stages of industry life cycle, and followed by a suitable strategy. See figure 8. Not much literature found addressing Porter's five-force analysis related to O&G industry. The Norwegian AI Industry can be seen to be soon in era of maturity. For further reading, Johnson *et al.* (2014) is recommended.

A business model captures how an organization deliver value to the customers and collect revenue. A successful business model is insufficient to assure competitive advantage. Coupling strategy and business model analysis is required to protect competitive advantage resulting from new business model design (Teece, 2010).

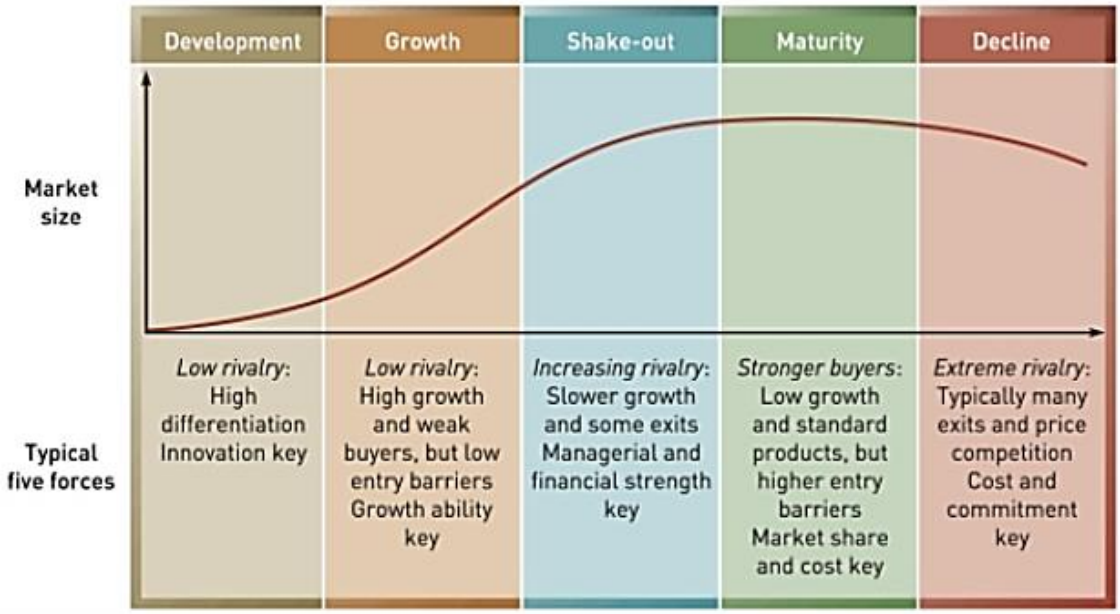

Figure 8. Industry life cycle with Porter's five forces (Johnson et al., 2014)

A strategy based on the Customer value helps organizations achieving the competitive advantage over their competitors. Organizations may chose different strategies in order to becoming more attractive in the market. Brandenburger and Harborne (1996) presents the four value-based business strategies, which is highly recommended for further reading. The need is for carefully selecting the suitable competitive strategy. The strategy should take into account the industry lifecycle, competitors' moves and value creation for all stakeholders to become more sustainable, profitable and attractive in the market.

5.7 Customer satisfaction & Relationship Management

Customer satisfaction is the Process of discovering whether a company's customers are happy or satisfied with the products or services received from the company. Knowing customers, their values and preferences provide insight towards increase growth and sales of the service-providers products and services (Haumann, Quaiser, Wieseke, & Rese, 2014). Kumar and Reinartz (2016) highlighted the most important task in marketing is to create and communicate value to customers to drive their satisfaction. They refer to customer value as a dual concept. First

to create the value for customers, second to measure and manage value returned from the customer (through multiple forms of engagement, loyalty etc.). Good interaction with customers is important for increased sales for any organization. As of today, in consumer market, there are wide range of channels available through which the companies interact with their consumers. These channels can be divided into 6 categories based on balance of physical and virtual contact. These include 1) sales force, services and personal representation 2) outlets, retail stores & depots 3) telephony, mobile and fax 4) Direct marketing, marketing mails, radio & TV) e-commerce including emails, internet and interactive digital video communications (Payne & Frow, 2005). Baird and Parasnis (2011) discussed interesting views about using social media as a channel for customer engagement. However, the power of social media and its profitable use lacks understanding of decision makers in a B2B environment. Evolution of social media and other networking sites can become a locomotive and therefore businesses should come along to realize the importance of these opportunities (Kaplan & Haenlein, 2010).

However, there must be mutual benefit for the customer and business using interaction channels. Use of social media channels by the customers and their willingness to engage with companies is not assumed to be taken for granted (Baird & Parasnis, 2011). Engaging customers through social media can help the marketers to understand customer participation and to attract new customers (Coulter, Gummerus, Liljander, Weman, & Pihlström, 2012). However there is not much literature available addressing the social media or other web-based channels in a B2B environment. Some potential benefits of CRM are 1) Increased customer retention and loyalty, 2) Higher customer profitability, (NS-EN13306) Creation value for the customer, 4) Customization of products and services, and 5) Lower process, higher quality products and services (Kim, Jung, Suh, & Hwang, 2006).

No organization is willing to let go any customer. Organizations do great effort to retain customers. Customer loyalty is a continuously positive purchasing behavior of a customer towards a certain company or brand which clearly will be affected by customer satisfaction (Bei & Chiao, 2006). They explored the hypothesis that service quality, product quality and price fairness have effect on customer loyalty and customer satisfaction. Bei & Chiao (2006) concluded with that service industries characterized by higher level of intangibility require a higher quality of service to enhance customer satisfaction and boost customer loyalty.

Most cited literature belongs to consumer market, oil and gas industry is different and lacking research about topics such as CRM, customer win-back strategies, social media in such B2B environment.

5.8 Services Innovation

Superiority and excellence in services provide a competitive advantage to any organization. Link between innovation activities and competitive advantage rests on four factors. 1) Innovations that are hard to imitate i.e. difficult for other firms to replicate 2) Innovations that accurately reflect market realities i.e. Customer-driven innovation ensuring important and desirable features included in product and/or service 3) Innovations that enable a firm to exploit the timing characteristics of the relevant industry i.e. being first enabling firm to gain experience before their competitors 4) Innovation that rely on capabilities and technologies that are readily accessible to the firm i.e. specific organizational capabilities needed to exploit and sustain innovation. For further reading, see (Lengnick-Hall, 1992).

Innovation requires extensive investments for exploring new ideas and technologies. In some cases, the technology managers may need to find an appropriate business model to capture value from that technology (Chesbrough, 2010). He argued that a company has much value to gain from developing an innovative new business model as from developing

an innovative new technology. He also discussed the barriers to the business model innovation. These barriers are real, lacking appropriate tools. Organizational processes must change and companies must adopt an attitude toward business model experimentation. It also affects organizational culture to find ways to embrace the new model, maintain the current business model effectivity until the new business model is ready to take over (Chesbrough, 2010).

Blanskon & Kalafatis (1999) discussed characteristics of services and their positioning strategy in the market. They concluded that all tangible products have some degree of services attached to it (Blankson & Kalafatis, 1999). Another definition of service can be portrayed as "To produce a service, therefore, is to organize a solution to a problem (a treatment, an operation) which does not principally involve supplying a goods" (Gadrey, Gallouj, & Weinstein, 1995). Innovation in services can be organizing solution to "new problems" identified as a result of interaction between service provider and client. The other possibility for innovation in services could be being more efficient (productivity or quality) to the same type of problem. This has been further elaborated later by Fitjar & Rodríguez-Pose in a survey about collaboration and modes of innovation in Norway (Fitjar & Rodríguez-Pose, 2013). The focus of survey was to identify two modes of learning for any organization. One is through "Science, Technology and Innovation (STI)" while other is "Doing, Using and Interacting (DUI)". It means that innovation in services can be possible either through an educational/research collaboration or through experience and interactions (with customers and suppliers, etc.).

In the AI Service Provider Industry, research is required to explore the interest into innovation, using new technologies, innovating business models and new product/service development.

5.9 Reflections and summary of cited literature:

Extensive cited literature address concept of customer value, customer relationship, business model targeting mainly consumer market. Whereas, in a B2B environment, these concept is not fully developed. Narrowing down to the Norwegian B2B industrial sector, a handful of previous researches are available. A recent effort focusing on business model innovation for Norwegian Maritime industry concluded with significant findings between maritime industry and the fields of business model (Fiksdahl & Wamstad, 2016). A research attempted in identifying customer experience and customer value in pre-purchase stage addressing leading Norwegian Service Providers (Kujala & Citic, 2015). Other cited literature investigated customer involvement in new service development (Luteberget, 2005).

Surprisingly, no published literature or business research found that is addressing business model concepts and customer value assessment in the Norwegian Asset Integrity (AI) market. There can be several reasons for lack of such research. One reason could be Company's internal routines for customer satisfaction surveys on regular basis, continuous Customer contact and follow-ups. Therefore, need for any extensive business research is either not considered as necessary or the management simply does not realize the potential of it. Customer satisfaction surveys may be "out dated", biased with project-specific focus, failing to gather important customer perspectives. There is seen a general lack of research about Customer Relationship Management (CRM), customer channels, business model innovation, power of social media and customer win-back strategies in a B2B environment.

Need for an empirical research in the AI market is therefore necessary to explore the above mentioned topics. Data collected from the experts show interesting trends and findings, which are summarized in the upcoming sections.

6 Presentation of trends and preferences in collected data

In order to capture and identify customer value, an online questionnaire survey was conducted. This section presents trends and preferences as extracted from analysis of the collected data from the survey.

This section focusses only on the capturing value trends and preferences without any conclusions drawn. Conclusions are summarized in Section 8.

6.1 Survey turn-out, participant and data preparation

The survey response data includes responses from 34 experts (referred to as respondent or participants hereafter). Nineteen (19) respondents from Norwegian AI Service provider whereas fifteen (15) from the Customers (O&G operators). Due to anonymity of the survey, it is difficult to say how many organizations (from both industries) took part in the survey. However, based on the sent invitations, it is estimated that experts from about 6-7 key organizations from each industry (AI Service Provider and Customer) are represented in the collected data. Turn out from AI Service Provider Industry was slightly higher than Customer. Total turnout of both surveys are shown below:

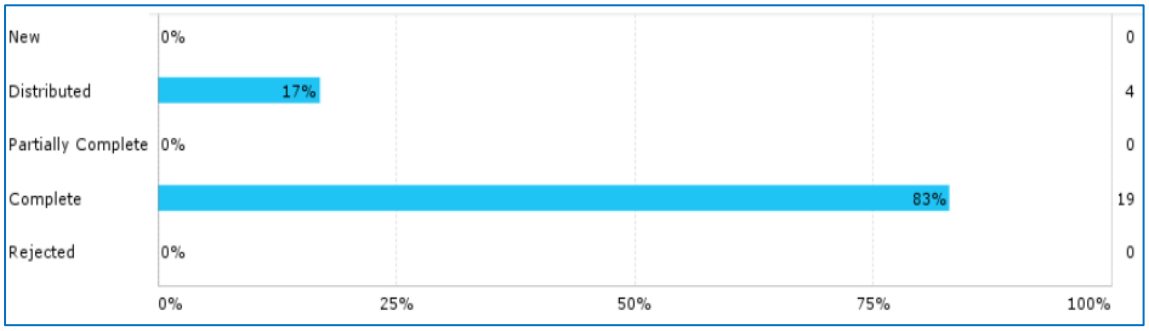

Figure 9. Participants from Norwegian AI Service Provider Industry [sample size 19]

Turnout from Customers (O&G Operators) is shown in the figure below.

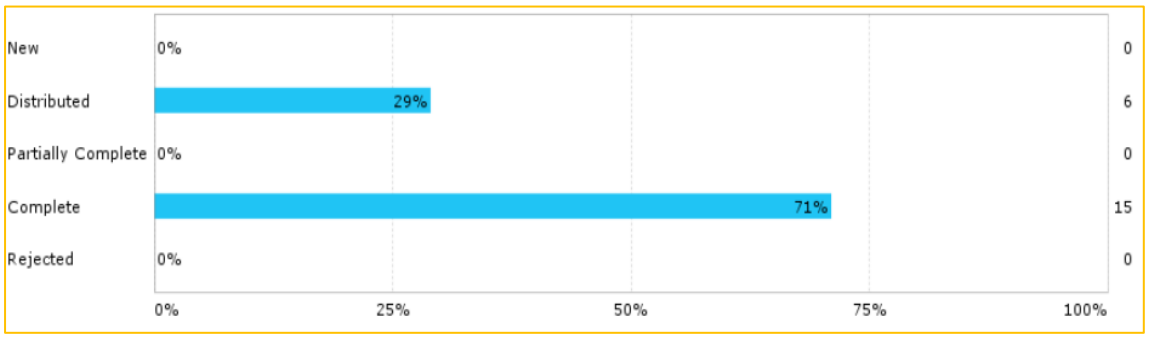

Figure 10. Participants from NCS O&G Operators (Customers) [sample size 15]

Below is summary of respondents' their expertise, positions and the size of AI teams in the organizations they represent.

Table 1a. Respondents from both industries, expertise

	AI Service Provider		Customer (O&G Operator)	
Experience	**Respondents**	**%**	**Respondents**	**%**
Less than 5 Years	3	16%	1	7%
5-10 Years	5	26%	4	26%
10-15 Years	8	42%	3	20%
More than 15 Years	3	16%	7	47%
Sample Size	**19**	**100%**	**15**	**100%**

Table below presents an overview of positions, roles & responsibilities of the participants.

Table 1b. Respondents from both industries, position and role

	AI Service Provider		Customer (O&G Operator)	
Position	**Respondents**	**%**	**Respondents**	**%**
Top Management	4	21%	1	7%
Department Head/Manager	4	21%	6	40%
Project Management	3	16%	1	7 %
Specialist/Expert	4	21%	3	20%
Lead/Sr. Engineer	4	21%	4	26 %
Total	**19**	**100 %**	**15**	**100 %**

Size of the AI business unit in each organization depends on organizational capabilities, resources and competences. Figure 11 shows size of AI business unit of the respondent from both Industries.

The survey turnout shows a good mix of medium- to large-scale organizations and highly skilled experts.

Figure 11. AI Business unit from both Industries

In order to capture value perception in the eye of Customers, most questions (About 60%) are asking for responses from Service Industry, simultaneously asking for Customers' perception. There are two main reasons for doing it; firstly, to capture any individual trends and preferences as found in each industry. Second objective is to be able to make a comparison to highlight any perception gaps (i.e. how much experts from Service industry agree/or disagree with the experts from the O&G Operators).

6.1.1 Survey participants

Online questionnaire was distributed to a carefully selected expert population from both industries. Selection of experts was based on their roles and expertise within the field of AI. Available online information on the web and LinkedIn profiles were reviewed to finalize the list of experts. Invitation for participation to questionnaire survey was distributed via email with URL link to online survey. Some received invitation through LinkedIn and Facebook (where other contact means

were not possible). In some cases, the request for participation was sent to the company mail for internal distribution. Three reminders were sent and the survey before closing the survey. The survey was voluntary and anonymous. All participants received brief guidelines and practical information on how to fill the survey.

6.1.2 Data preparation for analysis

First step in data analysis is to assign numerical value to the Likert Scale so that further analysis can be performed. The values are starting from highest to lowest agreement (i.e. more positive response gets a higher numerical value). Table below shows the Likert scale with assigned numerical values. The assigned values are similar for data collected from both industries.

Table 2. Assigned weights scores for data analysis to Category II and III responses[5]

CATEGORY II RESPONSES[5]	ASSIGNED NUMERICAL VALUES
STRONGLY AGREE	6
AGREE	5
SOMEWHAT AGREE	4
DISAGREE	3
STRONGLY DISAGREE	2
DON'T KNOW	1
CATEGORY III RESPONSES[5]	**ASSIGNED NUMERICAL VALUES**
YES	4
MAYBE	3
NO	2
DON'T KNOW	1

[5] See section 4.2.1 Questionnaire design for the response categories

In table above, do not know option is assigned the lowest value; however, this value is ignored in further calculations. Mean is not a recommended for calculating an average response from a Likert Scale. Therefore, weighting technique is used to calculate a collective weight of the responses. Following formula is used to assign weights to the responses for response to each question (Krista, 2015):

*(Number of respondent * numerical value for first scale) +*
*(Number of respondent * numerical value for second scale) +*
*(Number of respondent * numerical value for third scale) +*
*(Number of respondent * numerical value for fourth scale) +*
*(Number of respondent * numerical value for fifth scale) /*
Total Number of Respondent [6]

The purpose of assigning weighted score is to be able to compare responsive graphically. Higher weighted score shows more positive response (either more agreement or more willingness i.e. Yes). Upcoming section provides a summary of individual responses and trends from each industry. A comparison of both industries is provided in section 7 whereas conclusion in section 8 of this thesis.

[6] *Ref.*

Appendix B: Data analysis *for detailed calculations*

6.2 Trends and Preferences from AI Service Provider Industry

It is interesting to identify any specific preferences and trends among the experts. As described earlier in questionnaire design, few general information questions are asked in the start of the questionnaire. This is to gain brief understanding of the business model of the AI Service Provider organizations. A summary of the responses to the general questions is shown below. The preferences are based on a sample size of 19 experts from AI Service Provider Industry.

Table 3. Summary of general information questions (sample size = 19)

General Questions	Response from AI Service Provider Industry
Participation in any survey conducted by your organization, focusing on customer value, price and quality?	56% NO 44% YES
Contact level with the Customers (formal, informal meetings, email, phone etc.)?	42% DAILY BASIS 47% WEEKLY BASIS 11% MONTHLY BASIS
Spectrum of AI Services and Products they offer to the Norwegian Operators? (FEED, MMO, RBI etc.)	37% Offer all AI Services 58% Offer some AI Services 5% Offer only a few AI Services
Do you have Customers outside the oil and gas sector (Customer segment)?	53% NO 47% YES
Do you have any International Customers (diversity)?	63% YES 26% NO 11% DON'T KNOW

More than half of the total number of participants (56%) have not participated earlier in any survey focusing on Customer Value, pricing and quality. Customer contact frequency is quite satisfactory in all organizations. Only 37% of the AI Service Provider organizations are in position of offering all AI services to their Customers. 47% of the organizations have O&G operators as their main customers. About 63%

organizations are offering AI Services and products to international customers.

The upcoming bar charts, presents response data collected from Category II questions[7]. In Figure 12 and 13, green dotted lines represent "Strong Agreement" and red dotted line represents "Disagreement". The bars show a weighted score, which measures the strength of a collective response from all respondents. As an example, if all respondents strongly agree to a question, the blue bar will reach a score of 6 (Green dotted line), in case of a disagreement, the bar would get a score of 3 (Red dotted line). Table 4 explains interpretation of the responses from the collected data in the upcoming bar charts.

Table 4. Interpretation of the weighted scores (Category II questions)

CATEGORY II RESPONSES	EXPLANATION
Strong Agreement	Weighted score between 5 and 6
Weak Agreement	Weighted score between 4 and 5
Neutral	Weighted score between 3 and 4
Disagreement/Not preferred	Weighted score equal to 3 or below

Figure below shows a summary of response about different Price and Quality (P&Q) related questions

[7] See section 4.2.1 Questionnaire design for the response categories

Figure 12. Delivering Quality and Price, response from AI Service Provider industry (sample size = 19)

From the Figure above, it is clear that there is a consensus among AI Service Providers for quality issues. Summary of all responses in the Figure above is as under:

Strong Agreement:

- AI Service Provider Industry shows the highest level of agreement for delivering the quality as promised to their Customers (bar with the highest weights i.e. 5,21)
- Response about AI Service Providers' attractive for Customers due to quality, is mutually agreed by all experts (weighted score of 5,11)
- Integration of Customer quality requirements in their Quality Management System (QMS) has also received higher mutual consensus (score of 5).

Weak Agreement:

- Question about facing challenges in meeting Customers' price and quality (P&Q) requirements show a weak agreement, showing a weighted score of 4,79. This weak agreement is in fact a positive trend meaning that AI Service Provider does not find it challenging.
- Weak agreement is seen among experts' about the statement that higher quality AI Services and Products are higher in price (weighted score of 4,74).
- Lower prices makes an AI Service Provider attractive for their customer (score of 4,42) shows a weak mutual consensus.
- Experts show weak agreement when asked if their services and products are perceived expensive by their Customers (Score 4,26).

Neutral:

Lowest weighted score as seen in the Figure above is when respondents are asked about their competitors. Response shows a score of 3,79 when asked if their competitors are higher in price as compared to them.

Disagreement/ Not Preferred:

No disagreement found in the collected data!

Customer value is a central theme in this thesis and in AI Service Providers' business model. Response to the questions about Customer Value assessment show higher level of agreement among the respondents (see Figure 13 below)

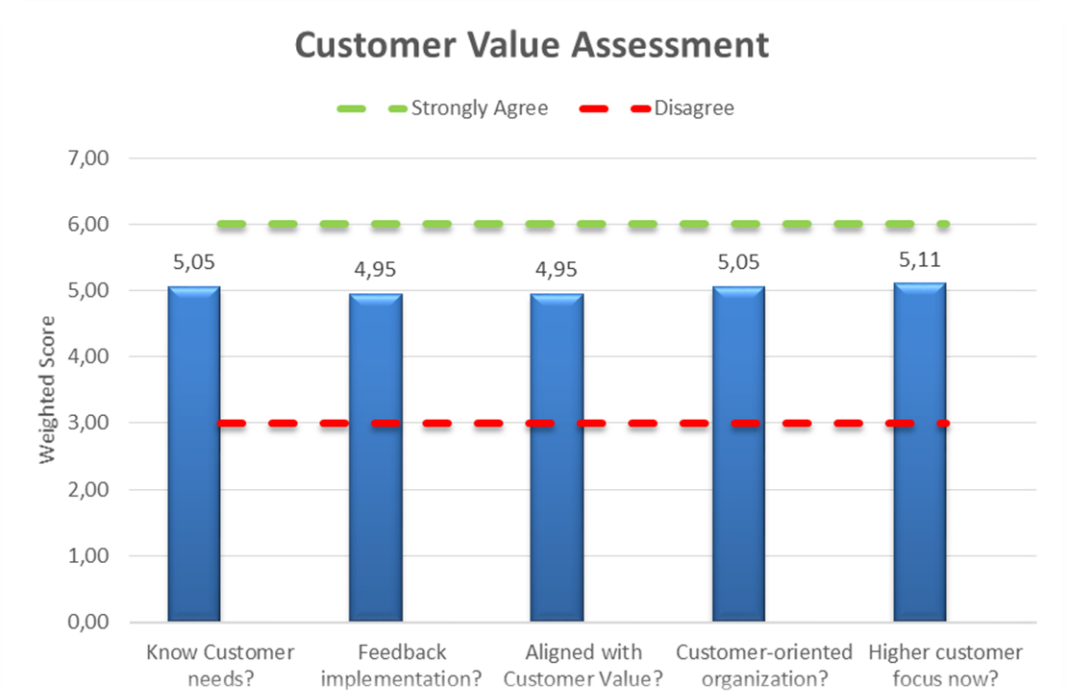

Figure 13. Customer Value (CV) assessment, response from AI Service Provider industry (sample size = 19)

Figure shows in general good sign of agreement in all respondent (all scores close to 5 or above). All responses are summarized under:

Strong Agreement:

- General consensus about if AI Service Industry has higher focus on Customer in current market situation (Score of 5,11)
- The importance of being Customer-oriented is strongly acknowledged (score of 5,05).
- Knowing Customer requirements is the also considered very important by all respondent (score of 5,05).

Weak Agreement:

- Weaker agreement seen for question about how much are they aligned with Customer values (score of 4,95).
- Systematic implementation of Customer feedback shows weak sign of agreement (score of 4,95).

Neutral:

No neutral responses found in the collected data!

Disagreement/ Not Preferred:

No disagreement found in the collected data!

Category III questions asked responses in form of "Yes", "No" and "Don't know". The upcoming figures summarizes responses to these questions. In the figures, a score of 4 represents "Yes" (Green dotted line) and 2 represents a "No" (red dotted line). Table 5 explains interpretation of the responses.

Table 5. Interpretation of weighted scores (Category III questions)

CATEGORY III RESPONSES	EXPLANATION
Yes	Weighted score between 3 and 4
Neutral	Weighted score between 2 and 3
No	Weighted score equal to 2 or below

Co-creation is key to new AI service or product in cooperation with other 3rd parties in form an alliance/joint venture. The alliance can be with Customer, a technology provider, or a competitor aiming to create value to the beneficiary (all involved parties). When asked questions about co-creation, the responses are represented in Figure 14.

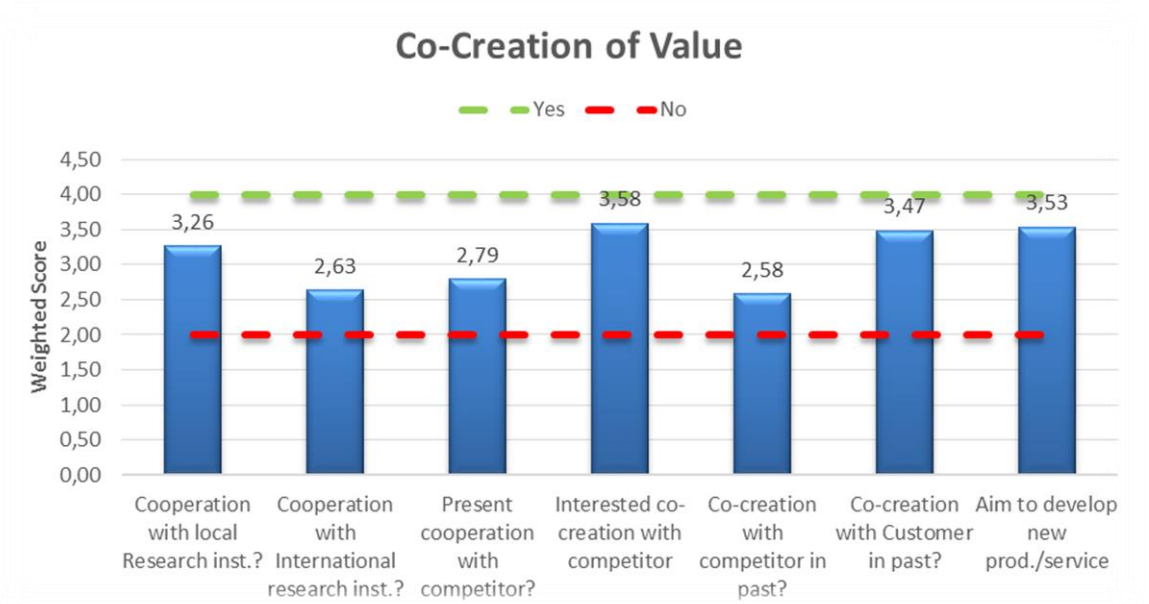

Figure 14. Willingness for alliance to co-create value (sample size = 19)

Yes:

- Figure shows highest score (3,58) of Yes to forming an alliance that may include competitors.
- The collective response shows interest to develop new products (score of 3,53).
- Responses show that AI Service Providers have co-created with their Customers in the past (score of 3,47).
- Responses show that SI Service Providers Industry have cooperation with local research institute (score of 3,26).

Neutral:

- Responses are neutral towards question about if AI Service Provider has any form of alliance with their competitors at the moment (score 2,79).
- Joint venture with any international research institute has also received a very low score (2,63) closer to a No.
- Question about co-creation with competitor in past shows a score of 2,58 interpreted as neutral.

No:

No disagreement found in the collected data!

Channels in a Business Model Canvas are Customer touch points. Questionnaire included some questions to identify preferences and about available e-channels and social media. The feedback is shown in the figure below.

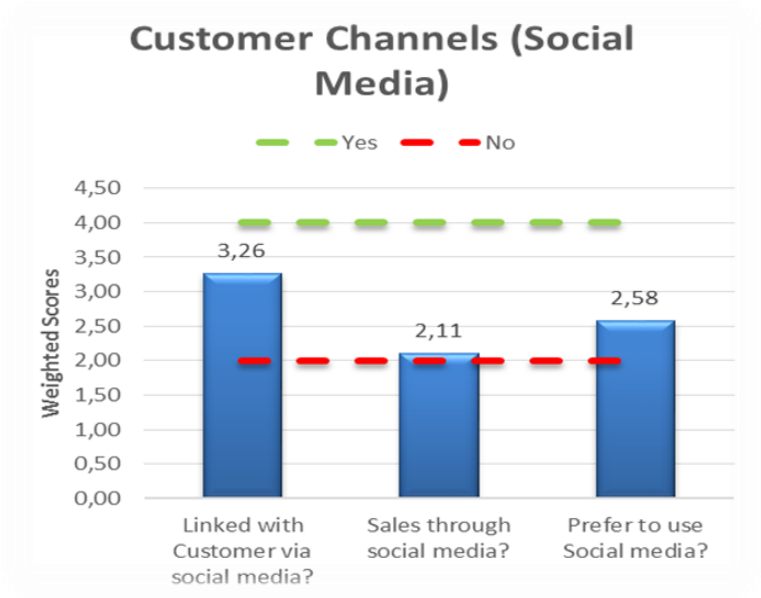

Figure 15. AI Services through e-channels, Response from AI Service Industry (sample size = 19)

Yes:

AI Service Provider industry responded positive (score of 3,26) to their connection with Customers through e-channels (e.g. Facebook, LinkedIn etc.)

Neutral:

- According to the responses, these e-channels are not preferred to engaging the Customers (score of 2,58).
- Response from being able to succeed with selling AI services (or products) through e-channels seems not to be so successful (score of 2,11).

No:

No discrepancies found in the collected data!

Business model and strategies help keeping a good customer relationship. Also winning any lost customers. Figure 16 shows a collective response from AI industry about the Customer win-back strategies.

Figure 16. Customer win-back status (past 3 years) (sample size = 19)

Yes:

AI Service Provider Industry has been successful in selling additional AI services and products to existing customers.

Neutral:

Answer to the questions asked about winning back lost Customer and re-selling to existing Customers shows neutral reply (score of 2,53). Seems that the AI Service Industry has not been| so successful in winning the lost Customer in past three years.

No:

No discrepancies found in the collected data!

Response to the question about visible integration of Business strategy with Customer Value (CV) is shown in Figure 17 below.

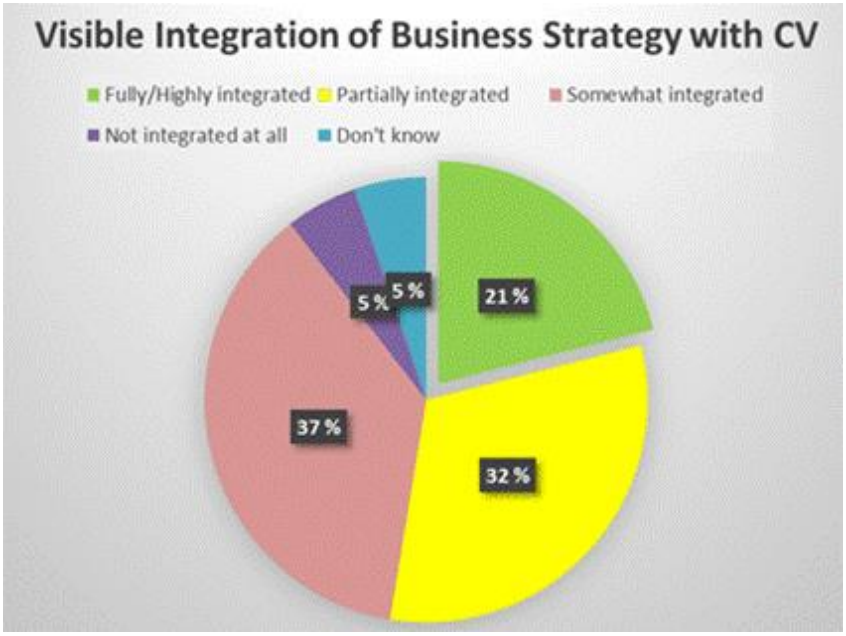

Figure 17. How integrated Business strategy is with CV? (Sample size = 19)

Responses shows only 21% respondent means that their organization has a "fully integrated" Business strategy with Customer Value. 32% means partial integrated whereas remaining 47% replies show that it lacks the strategic integration.

Responses to miscellaneous questions related with different building blocks in business model canvas are summarized in Figure 18.

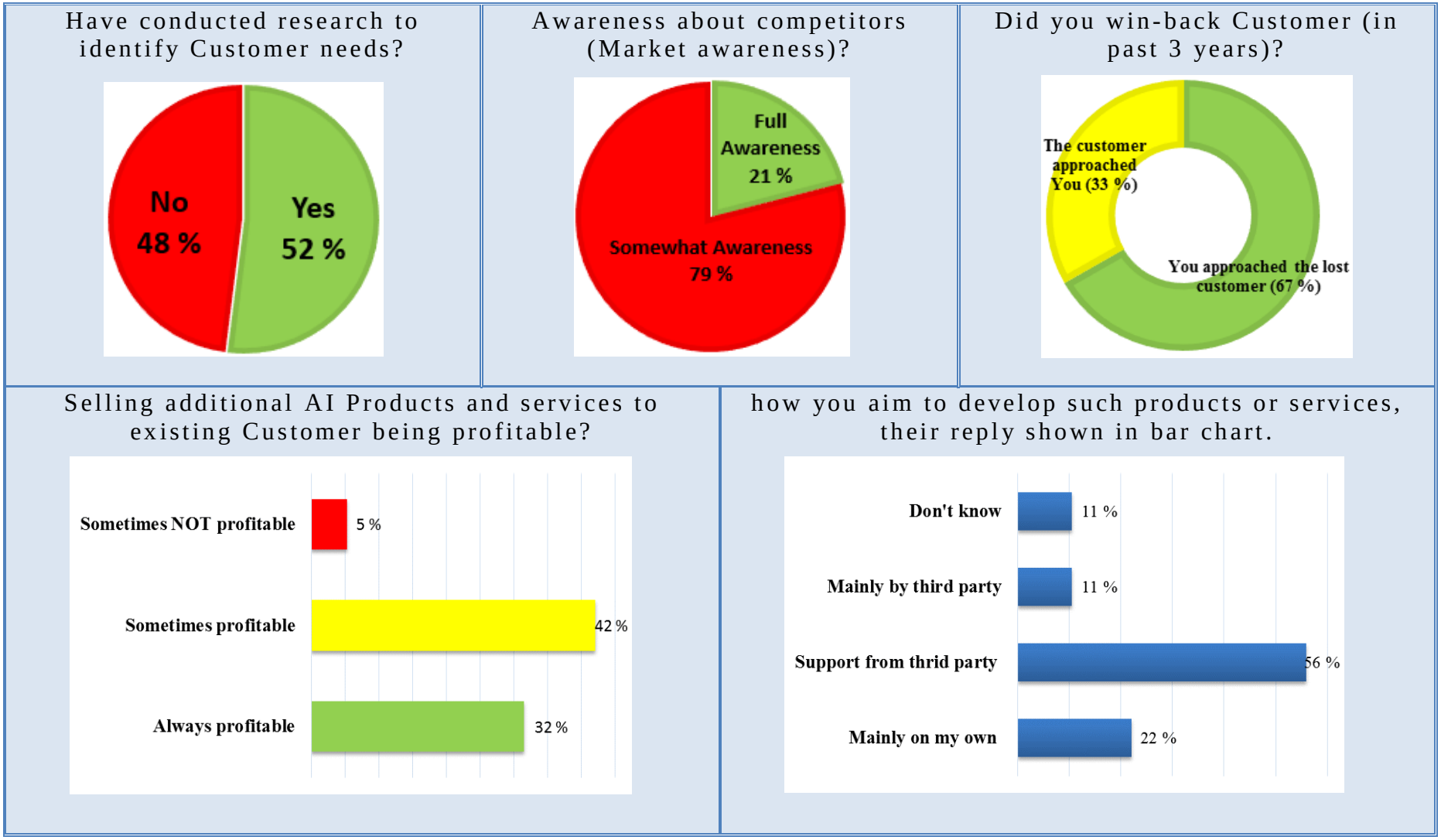

Figure 18. Miscellaneous Responses from AI Service Provider industry (sample size = 19)

Figure 18 shows interesting trends about AI Service Provider Industry. About half (48%) of the AI Service providers who participated in the survey have not conducted any research to identify customer needs. Awareness about their competitors is not very promising as indicated in the graph. Only 21% have full awareness of what their competitors sell. Responses show that the lost Customers do turn back to the AI Service Providers. The responses show that in most cases (67%), the Customers contacted the Service provider. Only in a few cases (33%), the Service provider has been successful in winning back a Customer.

In response to question about experiences with cross-selling 32% replied that cross-selling has been profitable. Whereas 42% mean it has been somewhat profitable i.e. not always. 5% experienced that cross-selling was not profitable at all. 56% of respondent show a positive response to developing new AI Products and Services with support from third party. Third party can be their Customers, sub-supplier or equipment manufacturers. 22% respondent aim to develop on their own whereas 11% aim to develop entirely by a third party.

Most of the responses above have roots within the Company's business model and strategies. Upcoming section summarizes responses and trends and preferences from data collected from the Customers, i.e. O&G Operators.

6.3 Trends and Preferences from Customers (O&G Operators)

This section highlights trends and captures customers' perceptions as observed from collected data from Customers. Responses to few general questions is shows in the table. The preferences are based on a sample size of 15 experts from Customers (O&G Operators).

Table 6. Summary of general information questions (sample size = 15)

General information	O&G Operators
Participation in any earlier survey focusing on Customer value, price and quality?	33% NO 60% YES
Contact with their Customers (formal, informal meetings, email, phone etc.)?	33% DAILY BASIS 47% WEEKLY BASIS 1% MONTHLY BASIS
Prefer to buy all AI Services and Products from one Service Provider, if available?	7% YES 93% NO

Table shows that 60% of the Customers have participated in survey focusing on customer value. However, the nature and purpose of the survey is unknown. The level of contact between Customer and AI Service provider, as seen from the collected data, is satisfactory. Based on the collected data responses, Customers seem not prefer to buy all services from single Service provider.

The upcoming bar charts, presents response data collected from Category II questions. Table 4, presented in earlier section, explains interpretation of the responses from the collected data in the upcoming bar charts.

Figure 19 presents the responses from collected data about Customers' perception of quality and price issues.

Figure 19. Quality and Price perception, response from Customers (sample size = 15)

Strong Agreement:

Figure above shows a strong agreement about perceived superior quality of the AI Products and Services (i.e. highest weighted score of 5,27).

Weak Agreement:

- Customers' perception about integration of Customers' values in AI Service Providers' Quality Management System (QMS) is not very visible, as seen in response from collected data (score 4,67)
- A question about if AI Service Provider finds it difficult to meet price and quality requirements, shows weak agreement, which is a positive trend (score of 4,47).
- Question about an AI Service Providers' attractiveness due to their lower price has received a weak agreement (score of 4,33). This is also a positive trend, not biased with only lower prices offered by AI Service Provider market.
- Customers' perception about paying higher price for a high quality AI Product or Service shows a weak agreement (score of 4,27)
- Question about perceived quality, as promised by the AI Service Providers shows a weak sign of agreement (score of 4,27).

Neutral:

Customers perception, about the general pricing of AI Services and Products is seen a neutral response with a score of 4,07 (neither agree nor disagree).

Not Preferred/Disagreement:

No disagreement found in the collected data!

Figure 20 shows customer perception about questions concerned with value, alignment, customer orientation, as seen in the collected data.

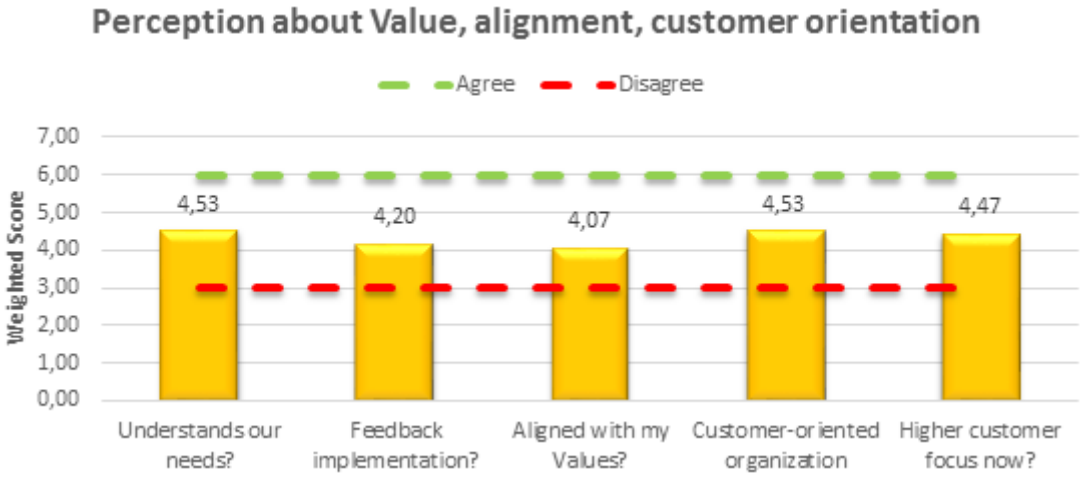

Figure 20. Customer Value, as perceived by the Customers (sample size = 15)

Strong Agreement:

No strong agreements found in the collected data!

Weak Agreement:

- Customers' perception about AI Service Provider's understand of their needs, shows a weak agreement (score of 4,53)
- Customer shows weak agreement about customer-orientation from AI Service Providers (score of 4,53).

- Question about Customers experience higher customer focus, at present market situation, show weak agreement (score of 4,47)

Neutral:

- Customer perception of implementation of thir feedback into AI Service Providers' services and products is seen as neutral (score of 4,20).
- How Customer perception about alignment with AI Service Provider is also seen neutral response, showing a score of 4,07

Not Preferred/Disagreement:

No disagreement found in the collected data!

Figure 21 presents a summary of responses about brand names, comfort-level, and superiority of the AI services (and products) they experience.

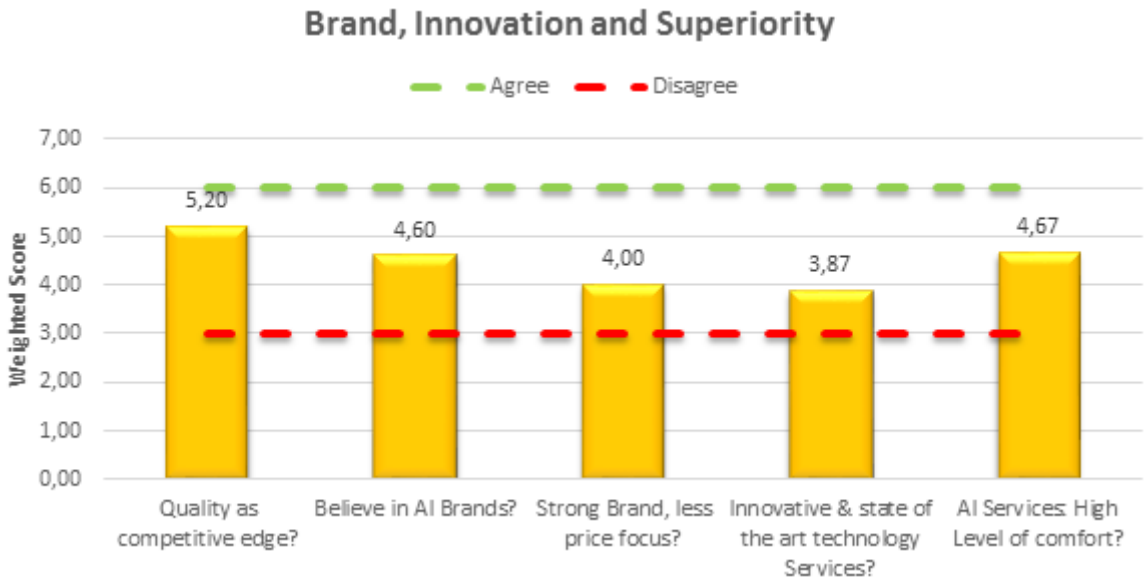

Figure 21. Brand, technology and innovation of AI Services in eyes of Customers (sample size = 15)

Strong Agreement:

Customer strongly believes that superior quality of AI Services and products can be a competitive advantage for the AI Service Provider (weighted score 5,20)

Weak Agreement:

- Perception of control and comfort of consumed AI Services and Products show a weak sign of agreement among Customers (score of 4,67).
- When asked about if Customers believe in strong brand names in AI Services and Products, response shows a sign of weak agreement (score of 4,60)

Neutral:

- Customer show sign of weak agreement to AI brands, but at the same time neutral response (score of 4,0) when asked about price focus become less when they with branded services.
- There is a question mark from the Customer perception about the level of innovation and state-of-the-art technology services (lowest score of 3,87 close to a disagreement).

Not Preferred/Disagreement:

No disagreement found in the collected data!

Category III questions require responses in form of “Yes”, “No” and “Don’t know”. The upcoming figures summarizes responses to these questions. In the figures, a score of 4 represents “Yes” (Green dotted line) and 2 represents a “No” (red dotted line). Table 5 explains interpretation of the responses.

Questions about co-creating value (together with AI Service Provider or other third parties) is shown in the Figure 22 below.

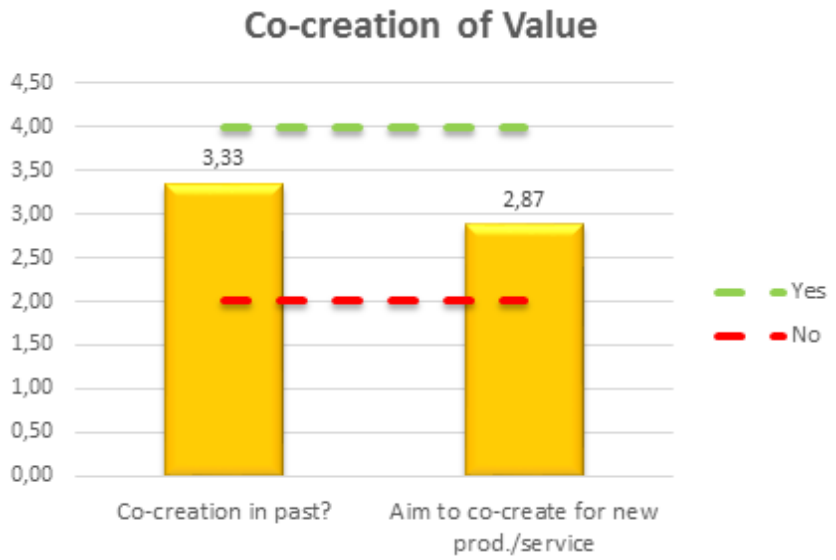

Figure 22. Willingness for Co-creation Response from Customers (sample size = 15)

Yes:

Response show that there has been co-creation in the past (score of 3,33).

Neutral:

Score of 2,87 shows the interest of Customers in co-creation for development of new AI products and services.

No:

No disagreement found in the collected data!

Customers were asked about their preferences for communication e-channels (such as Facebook, LinkedIn etc.), in connection with AI services and products purchases. The results are not very promising, as seen from responses found in collected data.

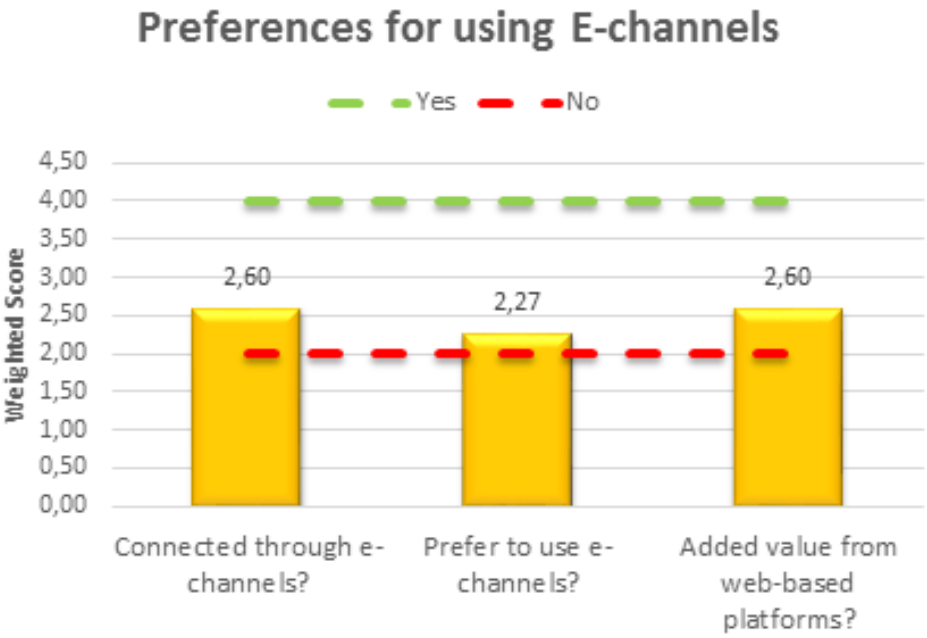

Figure 23. Preferences for using E-channels, response from Customers (sample size = 15)

Yes:

No disagreement found in the collected data!

Neutral:

- A neutral response is observed from the collected data about connected through e-channels with their service providers (score of 2,60).
- Customers show a neutral response to the question if the available e-channels provide any additional value to them (score of 2,60).

No:

Response about preferences in using social media channels for communicating with AI Service Provider seems not preferred as a useful channel (score of 2,27).

Sometimes, gives more “tangibility” to the Services. When asked from Norwegian Customers if have been offered such services, summary of response from collected data is shown in Figure 24.

Figure 24. Preferences for trial prior to purchases (sample size = 15)

In order to capture what is value in the eye of the Customers, the responses from collected data is shown in Figure below.

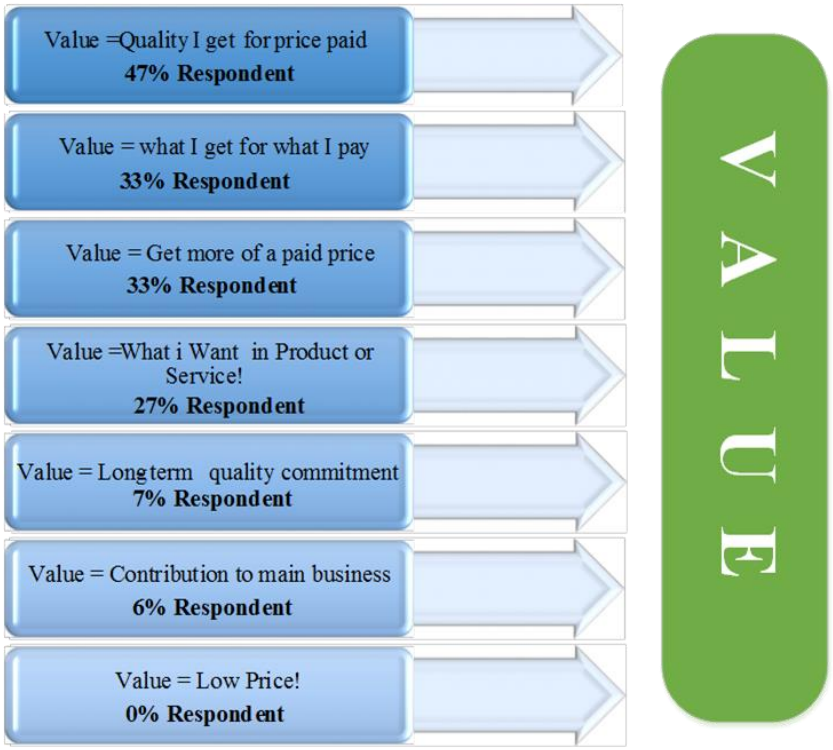

Figure 25. Preferences for Value, Customer feedback (sample size = 15)

Customer sees Value when:

- The quality of AI Services and Products is according to paid price for the Services & Products
- They perceive quality what they paid for and
- They perceive additional value from the paid services (added value)

One interesting trend is seen in Figure 25 that no Customer selected “low prices” as their prime value.

Trends and preferences to other miscellaneous questions is provided on the Figure 26.

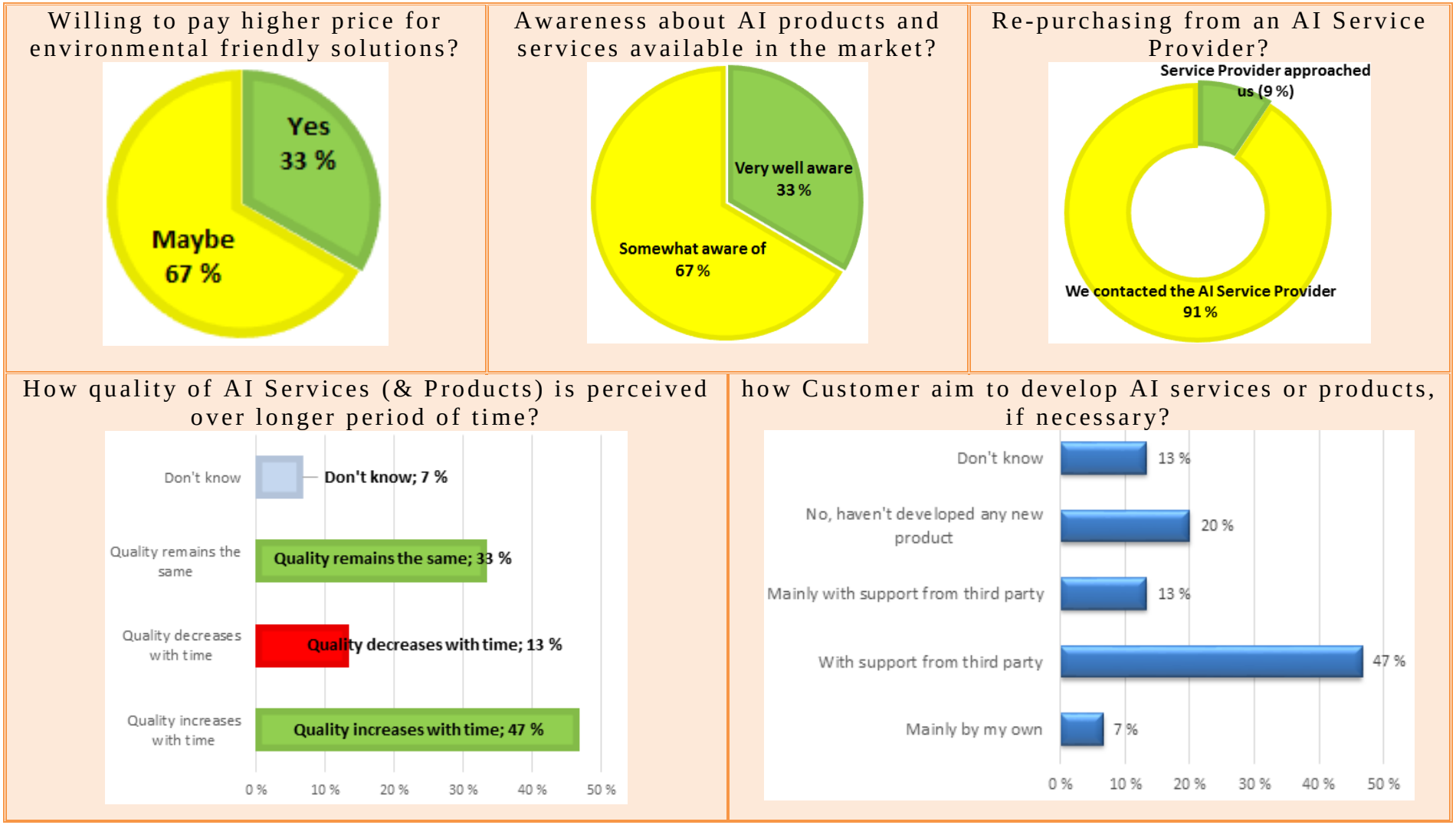

Figure 26. Miscellaneous Responses from the Customers (O&G Operators) (sample size = 15)

Summary of trends above show interesting trends.

- Customers' response from collected data shows higher willingness to pay higher price for environmental friendly AI solutions.
- Trend about Customer awareness about AI products and services shows that Customers are fully aware of what AI market has to offer.
- Customer do turn back to AI Service Provider for re-purchase. The trend from survey shows in the pie chart. In most cases (up to 91%) Customer contacted the AI Service Provider (whom they have had business in the past) to hire or purchase products or services.
- Another trend is obvious that when a Customer plans to develop a new AI Product or Service, by co-creating with help of third parties. In most cases, this could be AI Service Provider or other suppliers etc.

After capturing individual responses and preferences, upcoming section highlights gaps as seen from collected data gathered from both the industries. The purpose is to highlight any misalignment and perception gaps between the two industries.

7 Discussion of the Findings

Many interesting trends and preferences in collected data reveal worthy information among experts from both industries. It is important to mention that sample size for AI Service Provider Industry was 21% higher (19 respondent) than Customers (15 respondent). However, an assumption is made in this presenting findings is that the impact of this difference is insignificant. A comparison of data from both industries highlight synergies and perception gaps. Figures 27a and 27b summarizes these by plotting all responses together. A spider is preferred due to its graphical nature.

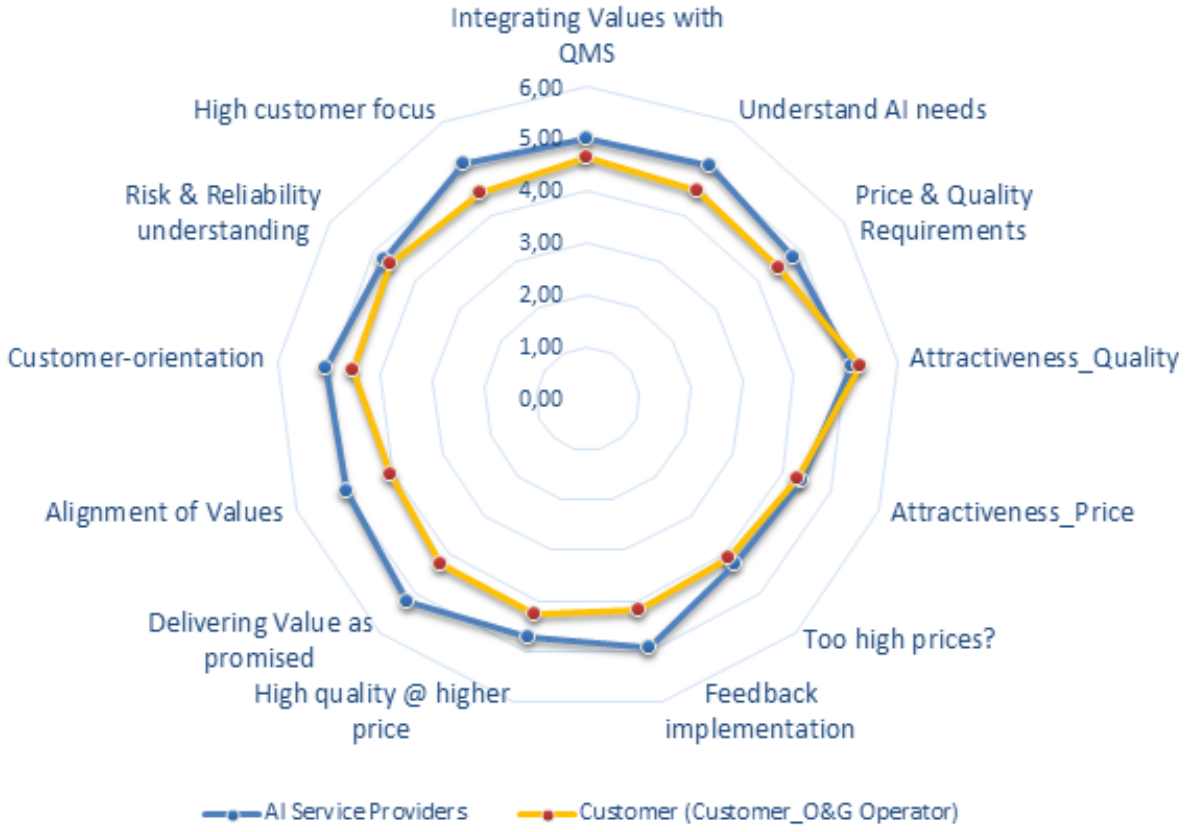

Figure 27a. Synergies and perception gaps between Service Provider and Customer (sample size = 34)

Figure above compares responses of Category II[8] questions. Interpretation of the weighted scores is according to Table 4.

[8] See section 4.2.1 Questionnaire design for the response categories

Figure 27b presents consensus and perception gaps between the two industries about Category III responses. Interpretation of the weighted scores is according to Table 5.

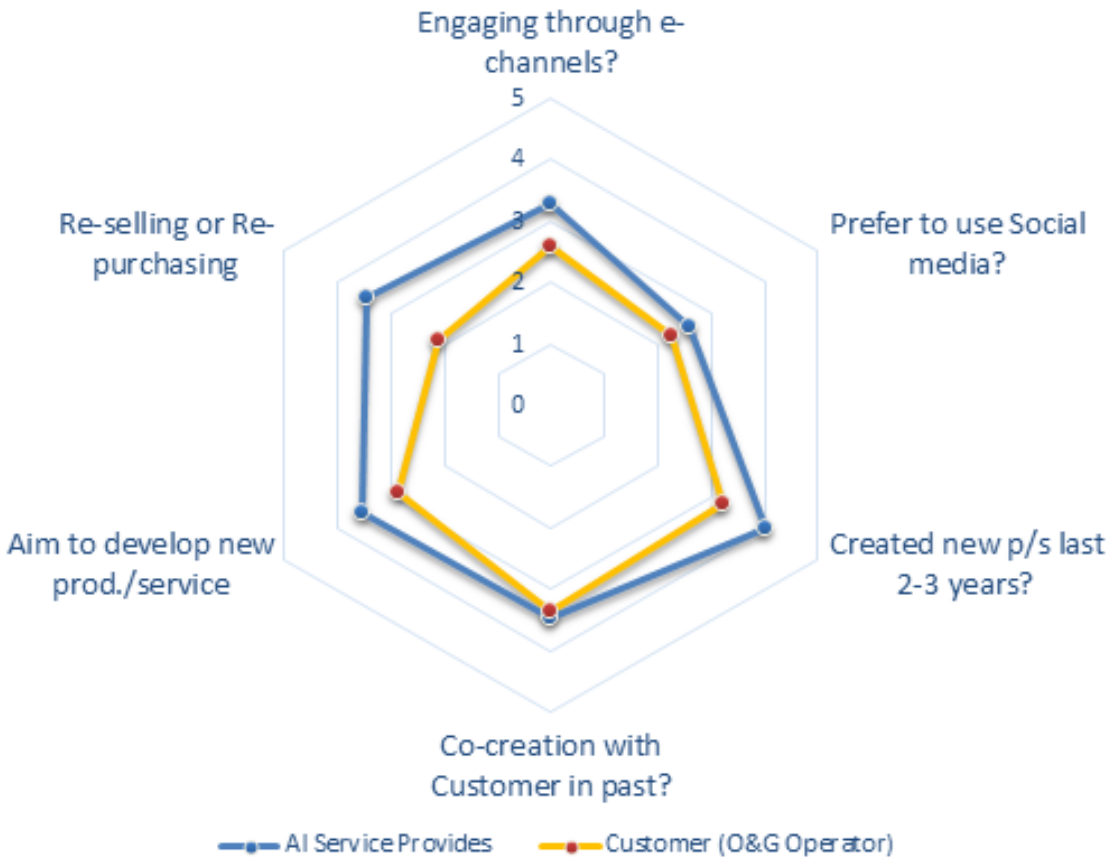

Figure 27b. Overview of synergies and perception gaps between industries (sample size = 34)

It is interesting to see that complete consensus from suppliers and customers is only on a few issues. The gaps in Figure 27a and 27b are merely perception gaps. These show AI Service Providers' "claim" versus the Customers' perception. Most of the responses shows a sign of positive agreement in both industries, but the level of the agreement is different for each response.

A consensus among all experts is clear about quality, which is central element in customer value in the business model. Customers seems not only obsessed with these pricing, but more about the quality they experience. AI Service industry also acknowledges this fact. In practice,

a good balance between pricing and quality of delivered AI services and products is required. Both industries acknowledge that they need better understanding of risk and reliability principles within the field AI. An interesting trend is for integration of customer value in quality management System (QMS). AI Service Providers' claim a strong agreement, but Customers' perception shows a weak agreement. Response about using the e-channels selling or purchasing through these mediums is not considered very attractive, as acknowledged by the experts from both sides.

There are clear perception gaps for questions about customer value, understanding customer needs, delivering and implementing customer feedback and being customer oriented (Ref. Figure 27a). Responses from AI Service Provider claim to fulfil Customer's value requirement, but not perceived as expected according to Customers' feedback. The gap in perception highlights the need for strategic approach in the business model. AI industry needs to re-think and revise their Customer policies, how to reach them and communicate with them. AI Service provider claim to be customer oriented at all times. However, according to the Customer feedback, it is clear that they feel higher attention today when in tough market situation. Perhaps customers are more valued in difficult business times. However, as a good business strategy, customer orientation should be visible at all times, independent of the market situations.

AI Service Provider has more focus on developing new AI products and services in past 2-3 years but not the Customers (See Figure 27b). In other case, the AI Service Provider has been successful in re-selling additional services or products to existing Customers, The Customers on the other hand, have not bought additional services in same manner from existing AI Service Providers. This needs strategic thoughts on how customers should be reached in order to identify customer problems. AI Service Provider industry seems to be lagging behind in creating new products and services in the past. This trend will perhaps change in

future, as the AI industry has a consensus about co-creation, through a strategic alliance.

Few pilot tests were run with some experts, prior to rolling out the full-scale survey. The purpose was to validate the quality, structure and clarity of the questions in the questionnaire. No statistical validation of the collected data is carried out in this research. The experts, whomever is interested, can validate the findings of the survey after reading the report.

8 Conclusions

The research attempted to answer questions relating to AI Service Providers business model. These focus on the value creation, value proposition, customer relationship and customer channels. Despite satisfactory contact between customer and supplier in the collected data (daily, weekly level), most perception gaps, in data, relate to customer value, understanding their requirements and alignment. Service provider need to re-think their business models and strategies to understand the value they offer through the services. The project-related contact focuses on day-to-day follow-ups and problem solving, not efficiently capturing and identifying customer value. Best way to increase understanding of customer value is through more business research. Once these are known, better business model and effective strategies can be developed on this foundation.

Despite large expenditures on state-of-the-art technologies, Customers believe that AI Services and Products lack innovation. This is perhaps result of either underestimating or exaggerating customers or market requirements. Customer show interest in co-creating value together, but are dependent on third party (which most cases is service provider). Customers have the authority of changing from one to other AI Service Provider (due to poor quality or better products etc.). Organizations with strong business models should focus on effective customer-win-back strategies.

AI Service Industry need find ways for collaboration with locally and internationally for creating of additional customer value. Knowing customers through available networking channels (e-channels) in the B2B environment is not fully explored. Despite a lot networking channels available for marketing products and services, both industries seem not be fully aware of the AI market. Perhaps all channels should be used for marketing and keeping customers aware about latest their products and services.

In today's tough market, where price is prime focus, results show that quality is a superior competitive advantage than lower prices. The only challenge is that customers usually cannot experience quality before they have purchased the services. A solution could be to add tangibility to the services by offering trial-basis (try-and-buy) to increase Customers' willingness-to-pay.

At the end of the questionnaire, all respondents were asked to give maximum of three suggestions on how the AI Service Provider Industry can become better, attractive and sustainable. The responses were random and different. All collected responses, associated with AI business model, are shown in Figure 28. Most of the input is related with the building blocks, which are main theme in this research. There are good suggestions that need management attention and strategic business thoughts.

8.1 Implication for Managers

This research presents a conceptual business model based on customer value concept, that can be used as a tool for making business strategies. The research also provides useful insights into how to capture Customers perception about quality and price, as promised by Service Providers. Knowing customer value, understanding their needs, true customer orientation and alignment are issues that are key to successful and sustainable business.

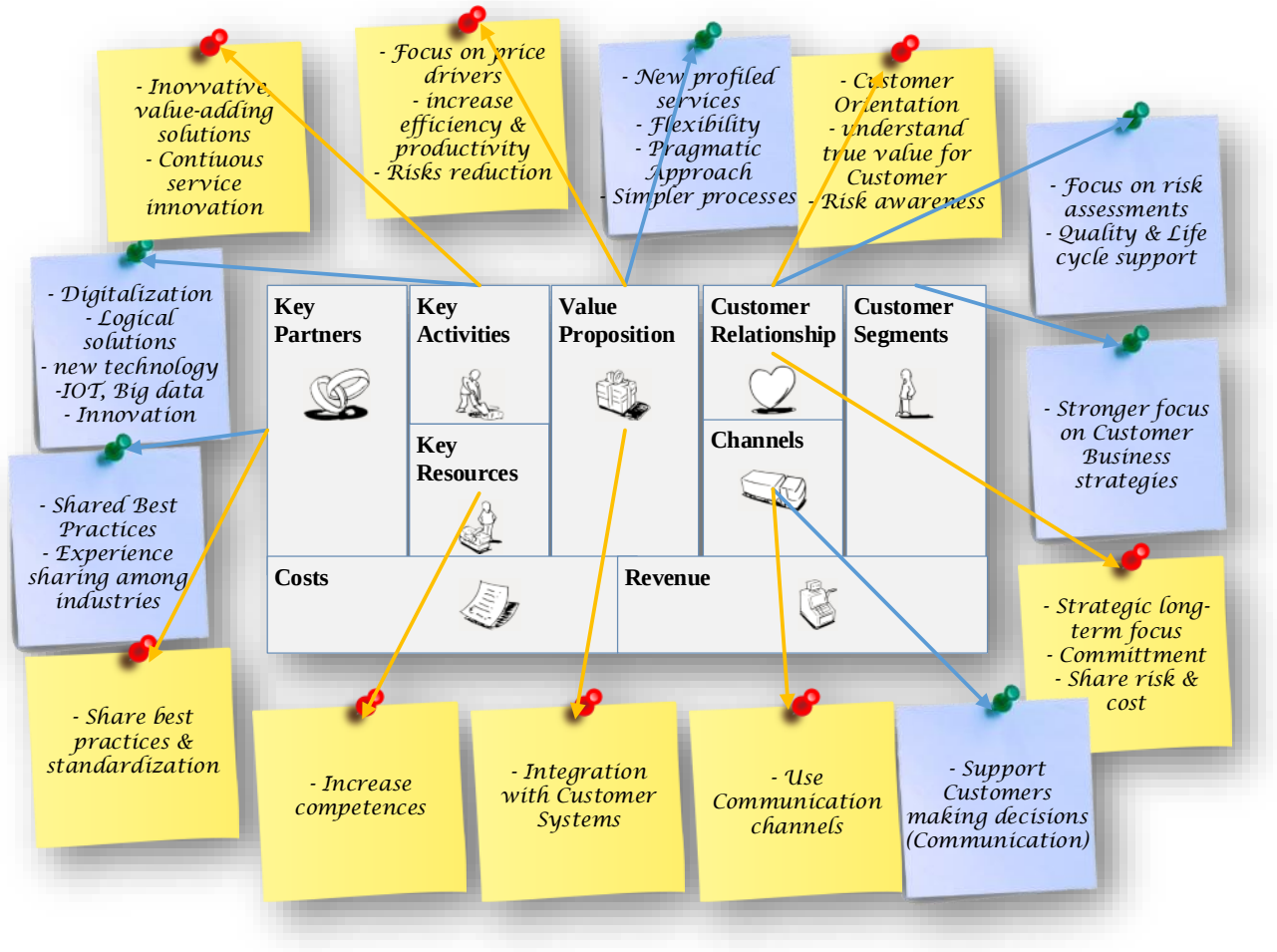

Figure 28. Suggestions from AI Service Industry and Customers, linked to Business model (sample size = 34) [9]

[9] Blue notes represents AI Service Providers' feedback and yellow notes represents Customers' feedback

9 Recommendations for further research

This is one of the first studies in Asset Integrity B2B and can be used as benchmark for future research. Many findings identified in this research work may require further research. Such as potential benefits or use of networking e-channels in AI B2B environment, not fully understood by the managers. A broader industry-wide analysis is needed taking larger population, including other stakeholder networks (e.g. suppliers and sub-suppliers). The results can be used as an input to competitive analysis such as SWOT and VRIO. Due to time constraints, a statistical correlation analysis of gathered data is not included. Further research can take into account methods to highlight any data associations. In general, there is a need for more research to further explore the research topics in a B2B environment.

10 References

Aguilar-Saven, R. S. (2004). Business process modelling: Review and framework. *International Journal of production economics, 90*(2), 129-149.

Anderson, J. C., Jain, D. C., & Chintagunta, P. K. (1992). Customer value assessment in business markets: A state-of-practice study. *Journal of Business-to-Business Marketing, 1*(1), 3-29.

Baird, C. H., & Parasnis, G. (2011). From social media to social customer relationship management. *Strategy & Leadership, 39* (5), 30 - 37.

Baron, S., Patterson, A., Oakes, S., Harris, K., Droege, H., Hildebrand, D., & Heras Forcada, M. A. (2009). Innovation in services: present findings, and future pathways. *Journal of Service Management, 20*(2), 131-155.

Batocchio, A., Ghezzi, A., Rangone, A., & Al-Mashari, M. (2016). A method for evaluating Business Models Implementation Process. *Business Process Management Journal, 22*(4).

Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The qualitative report, 13*(4), 544-559.

Bei, L.-T., & Chiao, Y.-C. (2006). The determinants of customer loyalty: an analysis of intangible factors in three service industries. *International Journal of Commerce and Management, 16*(3/4), 162-177.

Blankson, C., & Kalafatis, S. P. (1999). Issues and challenges in the positioning of service brands: a review. *Journal of Product & Brand Management, 8*(2), 106-118.

Boksberger, P. E., & Melsen, L. (2011). Perceived value: a critical examination of definitions, concepts and measures for the service industry. *Journal of Services Marketing, 25*(3), 229-240.

Brandenburger, A. M., & Stuart, H. W. (1996). Value-based business strategy. *Journal of Economics & Management Strategy, 5*(1), 5-24.

Chesbrough, H. (2010). Business model innovation: opportunities and barriers. *Long range planning, 43*(2), 354-363.

Coulter, K. S., Gummerus, J., Liljander, V., Weman, E., & Pihlström, M. (2012). Customer engagement in a Facebook brand community. *Management Research Review, 35*(9), 857-877.

Crespo Márquez, B., t Iung, M. M., Khairy Kobbacy, A., Macchi, M., Crespo Márquez, A., Holgado, M., . . . Barberá Martínez, L. (2014). Value-driven engineering of E-maintenance platforms. *Journal of Manufacturing Technology Management, 25*(4), 568-598.

Dictionary, B. (2016). [12.11.2016].

Doganova, L., & Eyquem-Renault, M. (2009). What do business models do?: Innovation devices in technology entrepreneurship. *Research Policy, 38*(10), 1559-1570.

Eggert, A., & Ulaga, W. (2002). Customer perceived value: a substitute for satisfaction in business markets? *Journal of Business & industrial marketing, 17*(2/3), 107-118.

Enkel, E., Gassmann, O., & Chesbrough, H. (2009). Open R&D and open innovation: exploring the phenomenon. *R&d Management, 39*(4), 311-316.

Fiksdahl, M., & Wamstad, M. G. (2016). *Business models in the maritime industry: A study of Norwegian Maritime actors aply and innovate their business models.* (M.Sc. degree, Industrial Economics and Technology Management, M.Sc.), Norwegian University of Science and Technology (NTNU), Trondheim, Norway.

Fitjar, R. D., & Rodríguez-Pose, A. (2013). Firm collaboration and modes of innovation in Norway. *Research Policy, 42*(1), 128-138.

Gadrey, J., Gallouj, F., & Weinstein, O. (1995). New modes of innovation: how services benefit industry. *International Journal of Service Industry Management, 6*(3), 4-16.

Gordijn, J., Akkermans, H., & Van Vliet, J. (2001). Designing and evaluating e-business models. *IEEE intelligent Systems, 16*(4), 11-17.
Gordijn, J., & Akkermans, J. (2003). Value-based requirements engineering: exploring innovative e-commerce ideas. *Requirements engineering, 8*(2), 114-134.
Greener, S., & Martelli, J. (2015). An introduction to Business Research Methods: Bookboon. com.
Haugan, B. (2017, 13.01.2017). Så mye tjener Norge på oljen. *VG*. Retrieved from http://www.vg.no/nyheter/innenriks/olje-og-energi/saa-mye-tjener-norge-paa-oljen/a/23895404/#xtor=CS4-1
Haumann, T., Quaiser, B., Wieseke, J., & Rese, M. (2014). Footprints in the sands of time: a comparative analysis of the effectiveness of customer satisfaction and customer-company identification over time. *Journal of Marketing, 78*(6), 78-102.
ISO. (2014). ISO 55000:2014 Asset management -- Overview, principles and terminology www.standard.no.
Johnson, G., Whittington, R., Regner, P., Scholes, K., & Angwin, D. (2014). *Exploring strategy* (10th ed.): Pearson Higher Ed.
Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. *Business horizons, 53*(1), 59-68.
Khurram, R. (2012). Customer Satisfaction.
Kim, S.-Y., Jung, T.-S., Suh, E.-H., & Hwang, H.-S. (2006). Customer segmentation and strategy development based on customer lifetime value: A case study. *Expert systems with applications, 31*(1), 101-107.
Krista. (2015). Getting weighted averages with the Likert question *https://blog.polldaddy.com/* (Vol. 2017). https://blog.polldaddy.com/: WordPress.com.
Kristensson, P., Matthing, J., & Johansson, N. (2008). Key strategies for the successful involvement of customers in the co-creation of new technology-based services. *International Journal of Service Industry Management, 19*(4), 474-491.
Kujala, L. C., & Citic, M. (2015). *Pre-purchase customer experience: Multiple case study of leading service providers in Norway*. (Master of Science in Economics and Business Administration M.Sc. thesis), NORWEGIAN SCHOOL OF ECONOMICS, Bergen.
Kumar, V., & Reinartz, W. (2016). Creating enduring customer value. *Journal of Marketing, 80*(6), 36-68.
Kumar, V. R., Werner. (2016). Creating enduring customer value. *Journal of Marketing, 80*(6), 36-68.
Kusumawardhani, M., Kumar, R., & Tore, M. (2016). Asset integrity management: offshore installations challenges. *Journal of Quality in Maintenance Engineering, 22*(3), 238-251.
Lapierre, J. (1997). What does value mean in business-to-business professional services? *International Journal of Service Industry Management, 8*(5), 377-397.
Lengnick-Hall, C. A. (1992). Innovation and competitive advantage: What we know and what we need to learn. *Journal of management, 18*(2), 399-429.
Levitt, T. (1960). Marketing myopia. *Harvard business review, 38*(4), 24-47.
Lietz, P. (2010). Research into questionnaire design. *International Journal of Market Research, 52*(2), 249-272.
Luteberget, A. (2005). *Customer involvement in new service development: How does customer involvement enhance new service success?* (M.Sc. Information and Communication Technology), Agder University College, Agder, Norway.
Magretta, J. (2002). Why business models matter. *Harvard Business Review – Spotlight: Practical Strategy, No. 5*, 1-6.
Maintworld. (2016). Lower costs with operational analytics. *Maintworld: Maintenance & Asset Management*, (2), 52. Retrieved from

https://www.yumpu.com/en/document/view/56150255/maintworld-issue2-2016

McDougall, G. H. G., & Terrence, L. (2000). Customer satisfaction with services: putting perceived value into the equation. *Journal of Services Marketing, 14*(5), 392 - 410.

Menon, A., Homburg, C., & Beutin, N. (2005). Understanding customer value in business-to-business relationships. *Journal of Business-to-Business marketing, 12*(2), 1-38.

Miller, D. (1988). Relating Porter's business strategies to environment and structure: Analysis and performance implications. *Academy of management Journal, 31*(2), 280-308.

MUELLER, M., & Mueller, M. (2013). MANAGEMENT BY EMPATHY. *Leadership Learning for the Future*, 227.

Nidumolu, R., Prahalad, C. K., & Rangaswami, M. R. (2009). Why sustainability is now the key driver of innovation. *Harvard business review, 87*(9), 56-64.

NPD. (2016). The government's revenues. Retrieved from http://www.norskpetroleum.no/en/economy/governments-revenues/

NPD. (2017a). Exports of oil and gas. Retrieved from http://www.norskpetroleum.no/en/production-and-exports/exports-of-oil-and-gas/

NPD. (2017b). Investments and operating costs. Retrieved from http://www.norskpetroleum.no/en/economy/investments-operating-costs/

NPD. (2017c). The service and supply industry. Retrieved from http://www.norskpetroleum.no/en/developments-and-operations/service-and-supply-industry/

NS-EN13306. (2010). NS-EN 13306:2010 Maintenance, Maintenance Terminology: Standard Norway.

OSTERWALDER, A. (2004). THE BUSINESS MODEL ONTOLOGY
A PROPOSITION IN A DESIGN SCIENCE APPROACH. *Doctoral Thesis*(Licencié en Sciences Politiques de l'Université de Lausanne).

Osterwalder, A., & Pigneur, Y. (2010). *Business model generation: a handbook for visionaries, game changers, and challengers*: John Wiley & Sons.

Osterwalder, A., Pigneur, Y., & Tucci, C. L. (2005). Clarifying business models: Origins, present, and future of the concept. *Communications of the association for Information Systems, 16*(1), 1.

Parasuraman, A. (1997). Reflections on gaining competitive advantage through customer value. *Journal of the Academy of marketing Science, 25*(2), 154.

Patterson, P. G., & Spreng, R. A. (1997). Modelling the relationship between perceived value, satisfaction and repurchase intentions in a business-to-business, services context: an empirical examination. *International Journal of Service Industry Management, 8*(5), 414-434.

Payne, A., & Frow, P. (2005). A strategic framework for customer relationship management. *Journal of Marketing, 69*(4), 167-176.

Petrovic, O., Kittl, C., & Teksten, R. D. (2001). Developing business models for ebusiness. *Available at SSRN 1658505*.

Phan, D. D. (2003). E-business development for competitive advantages: a case study. *Information & Management, 40*(6), 581-590.

Roulston, K. (2011). Working through challenges in doing interview research. *International Journal of Qualitative Methods, 10*(4), 348-366.

Stabell, C. B., & Fjeldstad, Ø. D. (1998). Configuring value for competitive advantage: on chains, shops, and networks. *Strategic management journal*, 413-437.

Teece, D. J. (2010). Business models, business strategy and innovation. *Long range planning, 43*(2), 172-194.

Vinten, G. (1994). Participant observation: a model for organizational investigation? *Journal of Managerial Psychology, 9*(2), 30-38.

Walter, A., Ritter, T., & Gemünden, H. G. (2001). Value creation in buyer–seller relationships: Theoretical considerations and empirical results from a supplier's perspective. *Industrial marketing management, 30*(4), 365-377.

Weathington, B. L., Cunningham, C. J., & Pittenger, D. J. (2012). *Understanding business research*: John Wiley & Sons.

Wikipedia. (2017). Deepwater Horizon oil spill. In Wikipedia (Ed.), *Wikipedia, the free encyclopedia*. https://en.wikipedia.org/wiki/Deepwater_Horizon_oil_spill: Wikimedia.

Woodruff, R. B. (1997). Customer value: the next source for competitive advantage. *Journal of the Academy of marketing Science, 25*(2), 139-153.

Yang, H.-C., Huang, C.-K., Hsieh, T.-H., Yu, H.-Y., & Lai, C.-S. (2016). EXPLORING CUSTOMER VALUE OF INNOVATION ACHIEVEMENT: ISM AND ANP ANALYSIS ON RECYCLED PAPER FURNITURE. *International Journal of Organizational Innovation (Online), 9*(1), 6.

Yin, R. K. (2003). *Case Study Research: Design and Methods* (3rd. ed. Vol. 5). USA: SAGE publications.

Z-008, N. S. (June 2011). Risk based maintenance and consequence classification.

Zeithaml, V. A. (1988). Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence. *The Journal of marketing*, 2-22.

Zott, C., Amit, R., & Massa, L. (2011). The business model: recent developments and future research. *Journal of management, 37*(4), 1019-1042.

11 Appendices

Appendix A: Questionnaires

Appendix A1: Questionnaire_AI Service Provider

Instructions:

All questions are multiple choice. You will be required to select ONLY ONE option.
Most questions require your feedback in terms of agreement/disagree to the statement. In some cases, you are welcome to provide any additional info., as if necessary.

The Survey takes no longer than 10 minutes, ALL RESPONSES SHALL BE KEPT ANONYMOUS.

We appreciate your valuable contribution! Thanks for taking the time to reply.

General info. 1

Have you participated in any survey focusing on Value, Price, Quality, in general, within Asset Integrity Services and Products (including maintenance & modifications)?

Response

- ❑ Yes
- ❑ No
- ❑ Other, Please specify _____

General info. 2

How many years of experience you have within Asset integrity Services (including Maintnenance & Modifications)?

Response

- ❑ Less than 5 Years
- ❑ 5-10 Years
- ❑ 10-15 Years
- ❑ More than 15 Years

General info. 3

Your role/responsibilities today in your organization?

Response

- ❑ Top or Line Management
- ❑ Department Head/Manager
- ❑ Project Management
- ❑ Specialist/Expert
- ❑ Lead/Sr. Engineer
- ❑ Other, Please specify _____

General info. 4

Your formal qualifications, select the most recent one (or ongoing)

Response

- ❑ Technical Education
- ❑ Bacehlors in Engineerig (B.Sc. Engineering)
- ❑ Masters in Egineering (M.Sc. Engineering)
- ❑ Bachelors in Economy/Finance/Management (Crespo Márquez et al.)
- ❑ Masters in Economy/Finance/Management (Nidumolu et al.)
- ❑ Doctorate (PhD)
- ❑ Other, Please specify _____

General info. 5

How much contact you have with your Customer (formal/informal meetings, emails/phone etc.)

Response

- ❑ Daily basis
- ❑ Weekly basis
- ❑ Monthly
- ❑ Yearly
- ❑ Very rare, only as Required
- ❑ Other, Please specify _____

General info. 6

Are you also involved (formally or informally) in marketing/branding/selling the Asset Integrity Services?

Response

- ❑ Yes
- ❑ No
- ❑ Other, Please specify _____

General info. 7

What is the size of your Asset Integrity organization (including engineers, discipline leads, managers, technicians)

Response

- ❑ Staff upto 50 personnel
- ❑ 50-100 personnel
- ❑ More than 100 personnel

General info. 8

Do your Asset Integrity organization offer study/FEED, Maintenance, modifications, Aset Integrity analysis and RBI/Inspection Services?

Response

- ❑ Yes, all of the mentioned services
- ❑ Yes, some of the mentioned services
- ❑ Only a few of the mentioned services

General info. 9

Do you have any Cusomter(s) OUTSIDE Oil and Gas sector whom you have sold any Asset Integrity Services/Products?

Response

- ❑ Yes
- ❑ No
- ❑ Don't know

General info. 10

Do you have any international Cusomter(s) (any sector) whom you have
sold any Asset Integrity Services/Products?

Response

- ❑ Yes
- ❑ No
- ❑ Don't know

Q1) The quality management tool and processes needs to be integrated with the Customer's Value

Response

- ❑ Strongly Agree
- ❑ Agree
- ❑ Somewhat Agree
- ❑ Disagree
- ❑ Strongly Disagree
- ❑ Don't know

Q2) I know my Customers, their needs and requirements.

Response

- ❑ Strongly Agree
- ❑ Agree
- ❑ Somewhat Agree
- ❑ Disagree
- ❑ Strongly Disagree

Q3) It is challenging to comply with Customer's quality and price requirements.

Response

- ❑ Strongly Agree
- ❑ Agree
- ❑ Somewhat Agree
- ❑ Disagree
- ❑ Strongly Disagree

Q4) Our delivered high quality standards, makes us an attractive Service provider to our Customers.

Response

- ❑ Strongly Agree
- ❑ Agree
- ❑ Somewhat Agree
- ❑ Disagree

- ❑ Strongly Disagree

Q5) Our lower pricing makes us attractive to our Customers.

Response

- ❑ Strongly Agree
- ❑ Agree
- ❑ Somewhat Agree
- ❑ Disagree
- ❑ Strongly Disagree

Q6) The Asset Integrity Services we provide are perceived to be expensive by our Customers

Response

- ❑ Strongly Agree
- ❑ Agree
- ❑ Somewhat Agree
- ❑ Disagree
- ❑ Strongly Disagree

Q7) Asset Integrity Services that my "Competitors" offer to the Oil and Gas market are expensive!

Response

- ❑ Strongly Agree
- ❑ Agree
- ❑ Somewhat Agree
- ❑ Disagree
- ❑ Strongly Disagree
- ❑ Don't know

Q8) Customer feedback is systematically collected, analyzed and implemented to improve our Asset Integrity Services

Response

- ❑ Strongly Agree
- ❑ Agree
- ❑ Somewhat Agree
- ❑ Disagree
- ❑ Strongly Disagree

9) High quality Asset Integrity Services/Products are higher in price

Response

- ❑ Strongly Agree
- ❑ Agree
- ❑ Somewhat Agree
- ❑ Disagree
- ❑ Strongly Disagree

Q10) Our Asset Integrity Services deliver the Value to our Cutomers, as promised!

Response

- ❑ Strongly Agree
- ❑ Agree
- ❑ Somewhat Agree
- ❑ Disagree
- ❑ Strongly Disagree

Q11) Our Asset integrity Service & Products are aligned with customer's values

Response

- ❑ Strongly Agree
- ❑ Agree
- ❑ Somewhat Agree
- ❑ Disagree
- ❑ Strongly Disagree

Q12) I work for an organization where Customer-Value is taken as an important tool for decision making

Response

- ❑ Strongly Agree
- ❑ Agree
- ❑ Somewhat Agree
- ❑ Disagree

- ❑ Strongly Disagree

Q13) How often you perform Customer satisfaction survey to get feedback about your delivered Services & Products?

Response

- ❑ 1-6 monthly basis
- ❑ 6-12 monthly basis
- ❑ Occasional/irregular basis
- ❑ Other, Please specify _____

Q14) When was a Product and/or Service updated/revised/modified based on a specific Customer Feedback?

Response

- ❑ A continuous process in my organization
- ❑ Services/products are updated on 6mnthly/annual basis
- ❑ Has happened in past 2-5 years
- ❑ Don't Remember/Don't know
- ❑ Other, Please specify _____

Q15) Have your organization, conducted any study/research to identify Customer's needs & demands? (NB: Exclude Customer feedback surveys)

Response

- ❑ Yes
- ❑ No
- ❑ Don't know
- ❑ Other, Please specify _____

Q16) How visibly your business strategy is integrated with Customer value?

Response

- ❑ Fully/Highly integrated
- ❑ Partially integrated
- ❑ Somewhat integrated
- ❑ Not integrated at all
- ❑ Don't know
- ❑ Other, Please specify _____

Q17) Are you connected with your Cusotmer via social media (facebook, Linkedin)?

Response

- ❑ Yes
- ❑ No
- ❑ Don't know

Q18) Have you been successful with sales through/using social media?

Response

- ❑ Yes
- ❑ No
- ❑ Not interested
- ❑ Not Relevant
- ❑ Don't know

Q19) Do you prefer to communicate with/engage your Customer via Social media (e.g. facebook, Linkedin) or other similar networking platforms?

Response

- ❑ Yes
- ❑ No
- ❑ Maybe
- ❑ Not interested

Q20) Does your organization have any formal cooperation/membership with any (local) Norwegian university/Research institute (e.g. UiS/NTNU/SINTEF/IRIS)

Response

- ❑ Yes
- ❑ No
- ❑ Don't know

Q21) Does your organization have formal cooperation/membership/agreement with any international university/Research institute?
Response
- ❑ Yes
- ❑ No
- ❑ Don't know

Q22) Does your organization have any formal cooperation/joint venture (at the moment) with any of your competitors?
Response
- ❑ Yes
- ❑ No
- ❑ Don't know

Q23) Will you be interested to cooperate/joint venture together with your Competitor?
Response
- ❑ Yes
- ❑ No
- ❑ Maybe
- ❑ Don't know

Q24) Have you developed any new Asset Integrity product or services in past 2-3 years?
Response
- ❑ Yes
- ❑ No
- ❑ Don't know

Q25) If you have developed new product/service, was it with cooperation from any of your suppliers (or your competetors)?
Response
- ❑ Yes
- ❑ No
- ❑ Not relevant
- ❑ Don't know

Q26) Have you developed any new/innovative product or service in past 2-3 years with cooperation with any of your Customers?
Response
- ❑ Yes
- ❑ No
- ❑ Don't know

Q27) Do you plan to develop new/innovative Asset Integrity products/service in future?
Response
- ❑ Yes
- ❑ No
- ❑ Don't know
- ❑ Not interested

Q28) if you aim to do so, How would you prefer to develop the new product/service?
Response
- ❑ Mainly by my own
- ❑ With support from other thrid party
- ❑ Mainly with support from third party
- ❑ Don't know
- ❑ Not Relevant

Q29) Asset Integrity Service Industry needs to better understand risk and reliability aspects to be able to create more value to its Customers
Response
- ❑ Strongly Agree
- ❑ Agree
- ❑ Somewhat Agree

- ❑ Disagree
- ❑ Strongly Disagree
- ❑ Don't know

Q30) In today's market situation, Do you agree with the statement that focus on Customer-value is much higher than before?

Response

- ❑ Strongly Agree
- ❑ Agree
- ❑ Somewhat Agree
- ❑ Disagree
- ❑ Strongly Disagree

Q31) Have you been successful in selling any new Asset Integrity Product/Services and products in past 2 years to an existing Customer?

Response

- ❑ Yes
- ❑ No
- ❑ Don't know
- ❑ Not interested _____

Q32) If your answer to the previous question was YES, Has this been profitable for your organization?

Response

- ❑ Yes, always profitable
- ❑ Sometimes profitale
- ❑ Sometimes NOT profitable
- ❑ Don't know
- ❑ Not Relevant

Q33) Have you won back any lost Customer in past 3 years (Lost Customers are those with whom you have had business in past)?

Response

- ❑ Yes
- ❑ No
- ❑ Don't know

Q34) If your answer to the previous question was YES, How it happened?

Response

- ❑ You approached the lost customer
- ❑ The customer approached You
- ❑ Don't know
- ❑ Not Relevant
- ❑ Other, please specify _____

Q35) How "well" you are aware about your competitors, their products and services etc.?

Response

- ❑ Very well aware
- ❑ Somewhat aware of
- ❑ Not aware at all
- ❑ Not concerned

What three things that you want to suggest Asset Integrity Service Industry to become sustainable and attractive?

_____
_____
_____
_____
_____

Thank you for participation, Your input is highly appreciated!!

Appendix A2: Questionnaire_ Customer

Instructions:

All questions are multiple choice. You are welcome to provide any additional information/comments., as if required.

In some places the abbreviation **AI** is used for **Asset Integrity** for simplification.

The Survey takes about max. 8-10 minutes to respond, ALL RESPONSES SHALL BE KEPT ANONYMOUS.

Appreciate your valuable contribution and time to give the input!

General info. 1

Have you participated in any survey focusing on Value, Price, Quality, in general, within Asset Integrity?

- ❑ Yes
- ❑ No
- ❑ Other, please specify _____

General info. 2

How many years of experience you have within Asset Integrity management (including Maintnenance & Modifications)?

- ❑ Less than 5 years
- ❑ 5-10 Years
- ❑ 10-15 Years
- ❑ More than 15 Years

General info. 3

Your role/responsibilities today in your organization?

- ❑ Top or Line Management
- ❑ Department Head/Manager
- ❑ Project Management
- ❑ Specialist/Expert
- ❑ Lead/Sr. Engineer
- ❑ Other, Please specify _____

General info. 4

Your formal qualification, select the most recent one (or ongoing)

- ❑ Technical Education
- ❑ Bacehlors in Engineerig (B.Sc. Engineering)
- ❑ Masters in Egineering (M.Sc. Engineering)
- ❑ Bachelors in Economy/Finance/Management
- ❑ Masters in Economy/Finance/Management
- ❑ Doctorate (PhD)
- ❑ Other, Please specify _____

General info. 5

How much contact you have with your Asset Integrity (AI) Service provider (formal/informal meetings, emails/phone etc.)

- ❑ Daily basis
- ❑ Weekly basis
- ❑ Monthly
- ❑ Yearly
- ❑ Very rare, only as Required

General info. 6

What is the size of your Asset Integrity management organization (including engineers, discipline leads, managers, technicians)

- ❑ Staff upto 50 personnel
- ❑ 50-100 personnel
- ❑ More than 100 personnel

Q1) My quality requirements are "visibly" integrated with Asset Integrity Service provider's quality management processes!

- ❑ Strongly agree
- ❑ Agree

- ❑ Somewhat agree
- ❑ Disagree
- ❑ Strongly Disagree

Q2) Asset Integrity Service provider undertands my needs and requirements very well!

- ❑ Strongly Agree
- ❑ Agree
- ❑ Somewhat Agree
- ❑ Disagree
- ❑ Strongly Disagree

Q3) It is challenging for the Asset Integrity Service provider to meet my quality and price requirements!

- ❑ Strongly Agree
- ❑ Agree
- ❑ Somewhat Agree
- ❑ Disagree
- ❑ Strongly Disagree

Q4) Higher Quality makes an Asset integrity provider more attractive!

- ❑ Strongly Agree
- ❑ Agree
- ❑ Somewhat Agree
- ❑ Disagree
- ❑ Strongly Disagree

Q5) Lower pricing makes an Asset Integrity Service provider more attractive!

- ❑ Strongly Agree
- ❑ Agree
- ❑ Somewhat Agree
- ❑ Disagree
- ❑ Strongly Disagree

Q6) Norwegian Asset Integrity Services & Products are expensive!

- ❑ Strongly agree
- ❑ Agree
- ❑ Somewhat agree
- ❑ Disagree
- ❑ Strongly Disagree

Q7) Excellence in Quality and superiroty of Integrity Services (& products) makes a Service provider more competitive?

- ❑ Strongly agree
- ❑ Agree
- ❑ Somewhat agree
- ❑ Disagree
- ❑ Strongly Disagree

Q8) Higher quality AI Services/Products are usually high in price!

- ❑ Strongly agree
- ❑ Agree
- ❑ Somewhat agree
- ❑ Disagree
- ❑ Strongly Disagree

Q9) My feedback about Services & Products is systematically collected, analyzed and implemented by the Asset Integrity Service provider(s).

- ❑ Strongly Agree
- ❑ Agree
- ❑ Somewhat Agree
- ❑ Disagree
- ❑ Strongly Disagree

Q10) Asset Integrity Service provider(s) deliver the Value (in terms of price, quality, services etc.) they promise ?

- ❑ Storgly Agree
- ❑ Agree
- ❑ Somewhat Agree
- ❑ Disagree
- ❑ Strongly Disagree

Q11) Asset Integrity Services & Products are completely ALIGNED with my requirements and standards?

- ❑ Strongly agree
- ❑ Agree
- ❑ Somewhat agree
- ❑ Disagree
- ❑ Strongly Disagree
- ❑ Don't know

Q12) Asset Integrity Service Providers are highly Customer-oriented (i.e. customer needs as highest priority, high customer focus etc.) ?

- ❑ Strongly agree
- ❑ Agree
- ❑ Somewhat agree
- ❑ Disagree
- ❑ Strongly Disagree

Q13) Do you believe in a brand of AI Services & Products (e.g. Company name/image, Product brand etc.)?

- ❑ Very strongly
- ❑ Strongly
- ❑ Not much
- ❑ Not at all

Q14) Do you agree that In case of a strong Brand of the AI Services (& Products), price focus becomes less?

- ❑ Strongly Agree
- ❑ Agree
- ❑ Somewhat Agree
- ❑ Disagree
- ❑ Strongly Disagree

Q15) Have you been offered "try and buy" for any AI Products (or Services) prior to purchase?

- ❑ Yes
- ❑ No
- ❑ Never
- ❑ Don't know

Q16) Are you willing to pay a higher price for more environmental friendly Asset Integrity Services & Products?

- ❑ Yes
- ❑ No
- ❑ Maybe
- ❑ Don't know

Q17) Are you connected with your Service Provider via social media (facebook, linkedin etc.)?

- ❑ Yes
- ❑ No
- ❑ Don't know

Q18) Would you prefer to communicate with Asset Integrity Service provider(s) via social media (e.g. facebook, linkedin etc.) or other similar networking platform?

- ❑ Yes
- ❑ No
- ❑ Maybe
- ❑ Not interested!

Q19) Do the web-based networking channels provide any "added value" (in terms of awareness about AI products/services, improved communication and access to the AI Service Provider)?

- ❑ Yes
- ❑ No
- ❑ Maybe
- ❑ Don't know
- ❑ Other, please specify _____

Q20) Asset Integity Services & Products are innovative and based on state of the art technologies?

- ❑ Strongly agree
- ❑ Agree
- ❑ Somewhat agree
- ❑ Disagree
- ❑ Strongly Disagree

Q21) How do you experience quality of AI services and products over a period of time?

- ❑ Quality of Asset Integrity services increases with time
- ❑ Quality of Asset Integrity services decreases with time
- ❑ Quality remains the same over time
- ❑ Don't know

Q22) Do you prefer to buy all AI products and services from one Service Provider, if available?

- ❑ Yes
- ❑ No
- ❑ Not Always
- ❑ Maybe
- ❑ Don't know

Q23) If you have developed any new Asset integrity product in past 3 years, how was it developed?

- ❑ Mainly by my own
- ❑ With support from third party
- ❑ Mainly with support from third party
- ❑ No, haven't developed any new product
- ❑ Don't know

Q24) Do you plan to develop new Asset Integrity Product in next 5 years?

- ❑ Yes
- ❑ No
- ❑ Maybe
- ❑ Don't know

Q25) If you aim to develop new Asset Integrity product, how would you prefer to develop it?

- ❑ Mainly by my own
- ❑ With support from third party
- ❑ Mainly with support from third party
- ❑ No plans for developing new product
- ❑ Don't know

Q26)Select the statement(s) that describe the "Value" of an Asset Integrity Service or product (select Max. TWO Options)

- ❑ Value is low price
- ❑ Value is what I want in a Product or Service I purchase
- ❑ Value is the quality I get for the price I pay for
- ❑ Value is to get more for a paid price
- ❑ Value is what I get for what I pay
- ❑ Other, Please Specify _____

Q27) Level of comfort (simplicity, clarity, useability) for the delivered Asset Integrity products and services is quite high?

- ❑ Strongly Agree
- ❑ Agree
- ❑ Somewhat Agree
- ❑ Disagree

- ❑ Strongly Disagree

Q28) Norwegian Oil and Gas Industry needs better understanding of risk and reliability aspects of their Assets' Integrity?

- ❑ Strongly agree
- ❑ Agree
- ❑ Somewhat agree
- ❑ Disagree
- ❑ Strongly Disagree

Q29) In today's market situation, focus on Customer value is much higher by Asset Integrity Service Provider(s) than before?

- ❑ Strongly agree
- ❑ Agree
- ❑ Somewhat agree
- ❑ Disagree
- ❑ Strongly Disagree

Q30) Have you repurchased services/products from an Asset Integrity Service Provider(s) in the past?

- ❑ Yes, more than 5 years ago
- ❑ Yes, in last 3-5 years
- ❑ No
- ❑ Don't know

Q31) If you have repurchased any AI Services/Products, how did it happen?

- ❑ Service Provider approached us
- ❑ We contacted the Service Provider
- ❑ Dont' know
- ❑ Not Relevant/No repurchase

Q32) How "well" are you aware of Asset Integrity Service providers (their products & Services)?

- ❑ Very well aware
- ❑ Somewhat aware of
- ❑ Not aware at all
- ❑ Not concerned

What are three things that you want to suggest to Asset Integrity Asset Integrity Service Provider Industry to become more sustainable and attractive?

_____
_____
_____

Thank you for participating the survey, your input is highly appreciated!!

Appendix B: Data analysis

Weightage calculations for Service Provider and Customer.

AI Service Provider			Strongly Agree	Agree	Somewhat Agree	Disagree	Strongly Disagree	Don't know	Weightage
	integrate QMS with CV?	Q1	6	9	2	2	0	0	4,37
	Know Customer needs?	Q2	4	12	3		0	0	4,74
	Compliance P&Q Requirement?	Q3	4	11	3	0	0	0	4,47
	Attractive due to Quality?	Q4	8	5	6	0	0	0	4,47
	Attractive due to Price?	Q5	3	7	4	5	0	0	4,63
	Price perception high?	Q6	0	8	8	3	0	0	5,26
	Comptetitors, high price?	Q7	1	3	9	4	1	1	5,11
	Feedback implementation?	Q8	5	8	6	0	0	0	4,79
	High Quality @ Higher price?	Q9	5	5	8	1	0	0	4,84
	Deliver quality as promised?	Q10	6	11	2	0	0	0	4,47
	Aligned with Customer Value?	Q11	4	10	5	0	0	0	4,84
	Customer-oriented organization?	Q12	8	5	5	1	0	0	4,37
	Risk & Reliability understanding	Q29	6	8	3	0	0	2	4,63
	Higher customer focus now?	Q30	8	7	2	2	0	0	4,16
			Yes	Maybe	No	Don't know			
	Need for Customer research?	Q15	10	3	6	0			3,21
	Linked with Customer via social media?	Q17	12	0	7				3,26
	Sales through social media?	Q18	3	1	11	3			2,11
	Prefer to use Social media?	Q19	3	5	11	0			2,58
	Cooperation with local Research inst.?	Q20	11	2	6	0			3,26
	Cooperation with International research inst.?	Q21	5	2	12	0			2,63
	Present cooperation with competitor?	Q22	9	0	7	3			2,79
	Interested co-creation with competitor	Q23	15	2	0	2			3,58
	Created new p/s last 2-3 years?	Q24	18	0	1	2			4,00
	Co-creation with competitor in past?	Q25	6	0	12	1			2,58
	Co-creation with Customer in past?	Q26	13	2	4	0			3,47
	Aim to develop new prod./service	Q27	12	5	2	0			3,53
	Re-selling existing Customer	Q31	14	0	5	0			3,47
	Won-back Customer in past3 years?	Q33	6	0	11	2			2,53

Customer response			Strongly Agree	Agree	Somewhat Agree	Disagree	Strongly Disagree	Don't know	Weightage
	Value integration with QMS?	Q1	2	7	5	1	0	0	4,67
	Understands our needs?	Q2	0	9	5	1	0	0	4,53
	Compliance P&Q Requirements?	Q3	3	3	7	2	0	0	4,47
	Attractive due to Quality?	Q4	7	5	3	0	0	0	5,27
	Attractive due to Price?	Q5	0	6	8	1	0	0	4,33
	Price too high?	Q6	0	4	8	3	0	0	4,07
	Feedback implementation?	Q8	2	3	6	4	0	0	4,20
	High Quality @ High price?	Q9	1	6	5	2	1	0	4,27
	Receiving quality as promised?	Q10	1	4	8	2	0	0	4,27
	Aligned with my Values?	Q11	0	6	6	1	2	0	4,07
	Customer-oriented organization	Q12	1	8	4	2	0	0	4,53
	Innovative products, state of art?	Q20	0	2	9	4	0		3,87
	Risk & Reliability understanding	Q29	2	5	6	2	0	2	4,60
	Higher customer focus now?	Q30	2	5	6	2	0		4,47
	Quality as competitive edge?	Q7	5	8	2	0	0		5,20
	Believe in AI Brands?	Q13	0	9	6	0			4,60
	Strong Brand, less price focus?	Q14	0	4	7	4	0		4,00
	AI Services: Innovative & state of the art technology?	Q20	0	2	9	4	0		3,87
	AI Services: High Level of comfort?	Q27	1	8	6	0	0		4,67
			Yes	Maybe	No	Don't know			
	Been offered try & buy?	Q15	4		9	2			2,40
	Willing to pay higher price for env. ?	Q16	5	10	0	0			3,33
	Connected through e-channels?	Q17	4	1	10				2,60
	Prefer to use e-channels?	Q19	1	3	10	1			2,27
	Added value from web-based platforms?	Q23	3	6	4	1			2,60
	Prefer to buy Services under one roof?	Q22	1	7	7				2,60
	Co-creation in past?	Q26	11	0	2	2			3,33
	Aim to develop new prod./service	Q27	3	8	3	1			2,87
	Re-purchase in past	Q31	2	0	11	2			2,13
	Won-back Customer in past3 years?	Q33	6	0	11	2			3,20

AI Service Provider's Recommendations!! What three things that you want to suggest Asset Integrity Service Industry to become sustainable and attractive?
- Shared best practices across industries. Focus on effective solutions for end user. Focus on use of historical data and continuous optimization. Documented cost savings combined with integrity control - New profiled services that stand out from existing solutions in the marked autonomous solutions - Easy presentationHigh QualityLong Exsperience - An issue is that we tend to spend more and more time at the computer analyzing statistics, regardless if the data necessary to find the correct answer exists. - We need to be more pragmatic and look at logic first and then, perhaps, back up with mathmaticians. Another thing is that we overcomplicate things to make it look nice, an example is the development of larger matrixes, 8x8 is not more correct than 3x3 or 4x4, however it is harder to understand for everyone and easier to make a wrong assessment. 1. Efficient work by use of new technology.2. Show benefit of methodology (cost-savings)3. Focus on quality and not cost for integrity evaluations - Better, clear and common understanding of the definition of AIM services Stronger focus on the clients business strategies 1. Condition based maintenance. 2. Barrier management. 3. RCFA and Defect elimination 1. Make use of bigdata colleted from IoT and manual feedback from maintenance systems. 2. Tailormade data analytics that present the true status of asset integrity, which will lead to reliable data for decisionmanagement. 3. Support customers to make good decisions in investing in assets, capital equipment that takes into account the whole lifecycle cost - Focus on preventive measures- Continue to develop technology- Digitalization and advanced analytics 1) Flexible with respect to customer.2) Innovative products to reduce cost to customer.3) Focus on quality and HSE. Increased efficiencyReduce manhoursPractical approche - Focus on innovate tools to do effiency asset integrity management* Focus on predictable maintenance strategy (analysis).Make an international bridge where the service industry can particpate to share experiences without that payment need to be done. - Data analysis - apply statistical thinking and methods to the available data for the given plant to perform the correct maintenance at the correct time - More innovative idea

Customer's Recommendations!! What three things that you want to suggest Asset Integrity Service Industry to become sustainable and attractive?
- Customer Recommendations!! - Lower price - Good quality - Customer oriented needs - Strategic focus on long term field developement, and where service providers fit in to this picture. - Inovative value-adding solutions - it solutions - reporting - commuication channels - Safety - Reliability and better risk management - Show tools and results - Cv of people with operation expeeiance. Not only phd. Phd do not cover real life - Have a "bank" of results - Oil&Gas industry should clean up and simplify in technical requirements. It's a jungle no navigate in! - Also reduce requirements for Third party verifications. This is price-driving factors. - We use to say; think New, buy old! - And be able to share more best practice and standarize 1. Continuous improvement of service quality 2. Continuous cost improvement 3. Continuous service innovation 1) Understand that their product / support is to be integrated into our systems / organizations 2) Share risk and cost 3) Commitment - RISK awareness - Cost and quality - Planning - Deliver good quality at an agreed price - Always ensure true value for the customer. To often too much Time and cost is wasted by consultants and engineers. This is why they are not used the next time.