

SAVONIA

University of Applied Sciences

THESIS – BACHELOR'S DEGREE PROGRAMME
TECHNOLOGY, COMMUNICATION AND TRANSPORT

DEVELOPMENT OF CONTRACT- BASED LIFECYCLE SERVICES FOR PILING MACHINES

Junttan Oy Service department

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Field of Study Technology, Communication and Transport	
Degree Programme Degree Programme in Mechanical Engineering	
Author(s) Henri Väänänen	
Title of Thesis Development of Contract-based Lifecycle Services for Piling Machines	
Date 15 May 2023	Pages/Number of appendices 40
Client Organization /Partners Junttan Oy, Sami Vartiainen, Manager of Service Agreements & Audits	
<p>Abstract:</p> <p>The aim of this thesis was to research possibilities for developing the service offering by contract-based lifecycle services for the piling machinery of the client organization Junttan Oy. The aim was to develop the services to match the global market need of the customers. Contract-based lifecycle services are addition to the service offering of Junttan.</p> <p>The theory section of the thesis consists of challenges and possibilities for Servitization and service agreements. Practical development work of the thesis was the base structure for the development process of the service agreements, to harmonizes the operations of the service organization and enables future improvements for service agreements.</p> <p>Development process focuses to internal step-by-step instructions for Junttan Oy, and its subsidiaries use to simplify and equalize processes around service agreements. Internal training material and templates are meant to be used whenever contract based life cycle services are operated. All internal material and instructions are meant for Junttan Oy and its subsidiaries use.</p>	
<p>Keywords Lifecycle service, Pile driver, Junttan Oy, service agreement, contract-based lifecycle services.</p>	

FOREWORD

This thesis is the final work before my graduation, and it was quite a challenge not only because of the workload of making the thesis but the external pressure for graduation. Thesis was done during spring 2023 with good co-operation relationship with Junttan Oy which is also client organization for this thesis.

Special thank you for Junttan Oy for this opportunity, thank you for representative on behalf of Junttan Oy Manager of Service Agreements & Audits Mr. Sami Vartiainen and thank you for my instructor on behalf of Savonia University of Applied Sciences Senior Lecturer Mr. Ari Jääskeläinen.

Henri Väänänen

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1 INTRODUCTION

1.1 Client organization Junttan Oy

Junttan Oy is a global machine manufacturing company, whose product catalogue focuses on different kind of foundation construction machinery like pile drivers, ExcaDrill drilling attachments, hydraulic hammers, and powerpacks to power hydraulic hammers. Junttan Oy's headquarters (Figure 1.) are in Kuopio, Finland and it includes eight departments' People & Communication, Finance, Production, Order & Supply Chain Management (SCM), Service, Technology & IT (Information Technology), Engineering & Product Management and Sales. Junttan Oy also has smaller offices in Tampere and Helsinki and also spare part center in Hyvinkää. In addition, Junttan has six subsidiaries located in Lacombe, Canada, Nieuwegein, the Netherlands, Delaware, United states of America, Gothenburg Sweden, Vineyard Australia and Newark, the United Kingdom.



Figure 1. Junttan factory in Kuopio, Finland.

Junttan Oy was founded in 1976 and the first piling rig was manufactured in 1979. Nowadays Junttan has approximately 200 employees in Finland, and it has a stable market share in piling business. Most of the Junttan products go to export and its main business areas are Europe and North America. Junttan has produced over 1000 piling rigs and over 1500 hydraulic hammers during its lifespan. Nowadays Junttan focuses more and more on aftermarket, part of the reason for this is because the lifecycle of the Junttan machinery is very long and the machinery needs different kind of services to keep up with the lifecycle. Aftermarkets account approximately for 50% of Junttan's yearly revenue and vision is to grow it even more in the future.



Figure 2. Junttan piling rig.

A piling rig is a heavy construction machine used to drive piles into the ground. It is commonly used in various construction projects, such as building foundations and bridges. Piling rig includes also piling tool which is the hammer. Junttan manufactures piling hammers which are hydraulically powered. The purpose of a pile driver is to create a solid foundation by inserting piles into the ground.



Figure 3. Junttan hydraulic hammer and powerpack.

The general principle of a piling hammer involves lifting a heavy weight then releasing it to generate a significant impact force to drive pile to the ground. There are different types of piling hammers, but Junttan focuses only hydraulically operated hammers. The hydraulic hammer gets power from the piling rig or a dedicated powerpack.



Figure 4. ExcaDrill drilling attachment.

ExcaDrill is an excavator-mounted drilling attachment provided by Junttan. ExcaDrill uses excavator's own hydraulic system and allows drilling diameters from 30mm up to 127mm and drilling depth up to 29 meters.

1.2 Junttan service

Junttan aftermarket organization is called Junttan service which includes seven different departments: Spare parts, Projects, Used machinery, DFA, Field Service & Technical support, Rental and the newest one, Service agreements. Spare part Department as namely provides spare parts for the existing machinery. Piling machinery owners order parts directly from Junttan Oy or from local subsidiaries. Projects Department focuses on custom built parts to specific purposes. Piling rigs need different kind of attachments for different kind of soil types and these can be provided by Junttan projects. Junttan also sells used rigs which have been modified or repaired by projects organization. DFA=Deep Foundation Analysis is expertized measuring service for customers who need to know the properties of mobilized pile. DFA Department goes to the piling worksite and attaches specialized sensors to piles and captures acceleration and strains of the pile. From this data they can tell how piling parameters of the machine should be set and how to avoid cracks in pile during piling. Field Service organization is responsible for deployment of new machines for customers and field service operations for preventative maintenances and fixing broken machines. Technical support is part of Field Service Department because the same personnel who are re-sponsible for field service also answer to customer technical support calls and emails. Rental Department rents piling machinery to customers work projects. Junttan rental fleet of piling machinery includes piling rigs, hammers and powerpacks which can be modified to fit customer work project. Service Agreement Department manages and develops service agreements operations. All Junttan Service Departments are keen on each other and assist each other to make good overall service offering for customers.

1.3 Ideology behind the topic

Piling job sites are usually very strictly scheduled by the job site contractor. If piling job is delayed, it delays all other parts of the construction work site as well. Piling contractors want to minimize their delays and divide the load to other parties if it is possible. Load can be divided with the lifecycle services which Junttan offers comprehensively, but service agreements which is the newest addition needs to be developed. Service agreements aim to build long lasting relationship between Junttan and piling contractors later mentioned as customer. When piling contractors want to ease the load of maintenance service agreements are a good solution. Service agreements release the responsibility of specific type of services from customer to Junttan for the agreement's duration. Service agreements also offer extra benefits like knowledge about the machine usability, wear condition, maintenance instruction etc. Junttan acts as service provider when it is spoken about service agreements. Some key values of Junttan are responsibility and customer care and service agreements are a good way to take a responsibility of maintenance and care customers. The content of the service agreement can vary a lot, but one thing is common that auditing should be included in the most of agreements increasing customer care and safety. Junttan's plan is to develop service agreements so that most of their customers would have service agreement in the future. The need to develop service agreements has come from the management level of Junttan but also from Junttan customers who have told interest to have lifecycle services or service agreements. (Figure 5.) and (Figure 6.) shows the difference of load for contractor with and without life cycle services provided by external service provider.

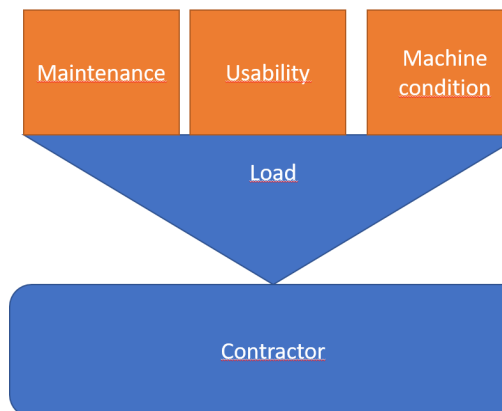


Figure 5. Load without lifecycle services.

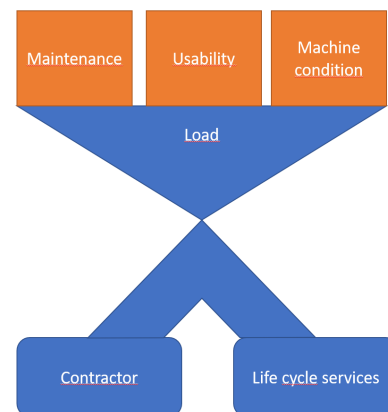


Figure 6. Load with lifecycle services.

1.4 Share of wallet

Share of wallet is a term used to define the amount or percentage of a customer's total expenditure on a specific category of products or services that is captured by a specific company. Basically, it represents the proportion of a customer's budget or "wallet" that a company is capable of acquiring in a specific market. Junttan's primary strategical scope is to develop service agreements because it extends the service offering to customers. Junttan can possibly increase the share of wallet of a specific customer if that customer has previously bought parts from another company but with agreement the customer decides to buy the same parts from Junttan. Because service agreements could build long lasting relationship between the customer and Junttan also the share of wallet from customer can be a long-lasting process.

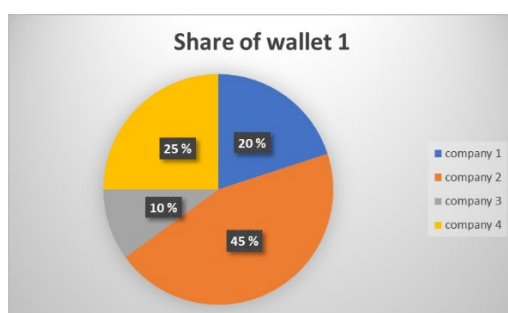


Figure 7. Share of wallet 1.

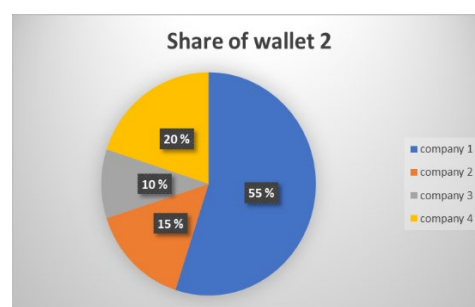


Figure 8. Share of wallet 2.

Example: Company 1 in Share of wallet 1 situation (Figure 7.) has only a 20% share of the customer's annual budget. Company 1 makes improvements to their offering and increases the share of wallet from other companies. Share of wallet 2 (Figure 8.) represents this situation and company 1 has a 55% share from the same company.

1.5 Sustainability & circular economy

Service agreements are part of Junttan's sustainability and circular economy plan to reduce environmental impact. Junttan already offers circular economy solutions for the customer by remanufacturing parts and overhauling old machines for customers. The concept of circular economy seeks to keep resources and products in use for as long as possible and Junttan tries to increase sustainable lifecycle of their machines. With offering service agreements, Junttan takes charge for certain parts of machines service and lead the way towards more sustainable way to work together with customers. Sustainability of service agreements and the circular economy are synergistic. Service agreements can decrease amount of waste and use of resources by extending the useful life of Junttan products and by ensuring that their product are well maintained and refurbished.

1.6 Tools for the thesis

For the thesis work was used client organization Junttan Oy's internal data which includes internal meetings and internal trainings provided by Junttan corporation. An extensive background information of operations around service agreements has been provided by Junttan Oy. Theoretical perspective for the thesis project comes from e-articles and e-books about lifecycle services, product lifecycle management and service operations. Real-life examples come from interviews of an existing customer and comparison interviews of different companies' lifecycle service models.

2 LIFECYCLE COST AND SERVICE

2.1 Lifecycle costs of piling machinery

Overall piling machinery costs for the owner are divided into two parts: ownership costs and lifecycle costs. Ownership costs are constant expenditure incurring yearly, regardless of whether the piling equipment is used or not. These costs are investment loan from the purchase of the piling machinery, taxes, insurances and storing costs. These costs are also called unavoidable costs which come automatically when owning a piling machinery.

Lifecycle costs are the costs incurring when the piling equipment is used. The amount of lifecycle costs depends very much on how piling machinery owner decides to handle these costs. Some lifecycle costs are mandatory costs if the piling machine is used like fuel costs, operator labor costs, lubrication etc. Lifecycle costs which are dependent on the maintenance method of piling machinery are the focus point of services provided by Junttan. Lifecycle services which are provided by Junttan are focusing on recommended consumable parts, safety features, special items, and usability of piling machinery.

2.1.1 Lifecycle services costs from the customer's perspective

Productivity of Junttan piling machinery is very dependent on regular lifecycle costs invested in the piling machinery by the owner. There are several reasons why piling machinery owner should think of the lifecycle costs of the machinery.

The first one is improved equipment performance: Regular maintenance can help keep piling machinery in optimal condition, which will enhance their performance and efficiency. By keeping equipment clean, lubricated, and functioning according to instructions, it can prevent issues such as breakdowns, malfunctions, and poor operation.

Secondly is increased lifespan of piling machinery: Well-maintained machinery can have a longer lifespan, meaning it can provide more value and use for the investment. By performing regular maintenance, piling machinery owner can prevent costly repairs or replacement and maximize the lifespan of piling machinery. Piling machinery is designed to have more than ten years life span without major component replacements. Efficient lifespan of the piling machinery can be shorter or even extended with regular lifecycle services to piling machinery. Even though lifespan of the piling machinery is long it is not eternal. At some point it is more efficient to upgrade to new machinery and then resale value can be higher or lower depending on the condition of the piling machinery. Having a documented history of regular maintenance, audit reports, can enhance its resale value. Potential buyers will be more willing to purchase well-maintained equipment that has a track record of reliable operation.

Piling machinery can pose a significant risk of injury or accidents, especially when poorly maintained. Regular maintenance can ensure that equipment is safe to operate and less likely to malfunction or cause accidents, reducing the risk of injuries and liability. Foundation sites are more and more restricted with safety parameters. That's why it is essential to be able to prove safety factors of the foundation job to the primary operator of the construction site. Regularly audited and well maintained piling machine increases the safety.

While regular maintenance requires an investment of time and money, it can ultimately save money in the long run. By preventing costly repairs, reducing downtime, and increasing equipment lifespan, maintenance can help you avoid unexpected expenses and maximize the value of the equipment. Foundation sites are tightly scheduled and piling contractors usually agree latency penalty with primary operator of the construction site. Reputation of the piling contractor is affected if piling job is constantly late in every foundation site which will lead to less job offers from construction site primary operators.

2.1.2 Junttan perspective

Lifecycle services for the machine do not bring any added value for the customer because all services to machine cause a pause to piling work. For Junttan as a piling machinery manufacturer and aftermarket service provider it is essential that the customer experience around lifecycle services is positive. If operating lifecycle services is extremely difficult for the piling machinery operator and customer has feeling that they do not get needed assistance to handle workload of lifecycle services experience is negative. These customers are very unlikely to invest in the same kind of piling machinery in the future. On the other hand, if there is reputation of owning Junttan piling machinery is easy and piling machinery owner gets needed support for lifecycle services it will look good in the big picture and attitude towards Junttan machines is positive from customers. Junttan has to have large offering of lifecycle services to satisfy different kind of customers' needs and creates positive

vision about Junttan machinery. Junttan also carries responsibility to provide servicing instructions to their customers how lifecycle services should be maintained. Without instructions it is difficult to expect operators to invest to the lifecycle services. When lifecycle services work well it will boost business of Junttan new machinery sales and Junttan service sales.

3 SERVITIZATION PROCESS

3.1 Service orientated business

Traditional product-focused companies have concentrated on manufacturing and selling their products but in recent years, numerous companies have shifted their focus to providing services in addition to their products. The expansion of service offering within product-focused companies has followed a particular pattern over time. Historically, companies mainly provided services as an addition to their products. Many businesses have shifted to offering services as a standalone product in the present day, meaning that services are not an add-on to the product. The rise of subscription-based services has made it simpler for companies to offer services individually. It is expected that service offering will continue to grow in the future when technology of products goes further. Products become internet-connected and the demand for services to manage and maintain these products will increase. Transition towards services is typically a strategic response to achieving the majority phase of a product's lifecycle and, as a result to companies can achieve bigger revenue growth and share of wallet. At the same time gain better customer experiences and relationships also differentiate themselves from their competitors. (Gebauer, Kowalkowski, and Rogelio, 2017.) Junttan have already started offering different services for past year and started to move their offering towards service. Service agreements are the Junttan solution to offer subscription-based services which are expected by customers. Piling machinery operational lifespan is very long easily 10-15 years without major component updates which leads to large achievable revenue if services are provided well.

Study shows that machine manufacturers have shifted their focus to services from just product focused business thinking to consolidate their positions in increasingly competitive markets and increase their revenue and margins. Illustration for that is in (Figure 9.). Companies with a focus on services have begun transitioning from services that support products to services that support client processes. By aligning product-based services with client operations throughout the product's lifecycle. By standardizing service-operations and developing their offerings manufacturers can capture revenue streams of the whole lifecycle of product, cut costs, and gain advantage against competitors. (Reinartz and Ulaga, 2011.)

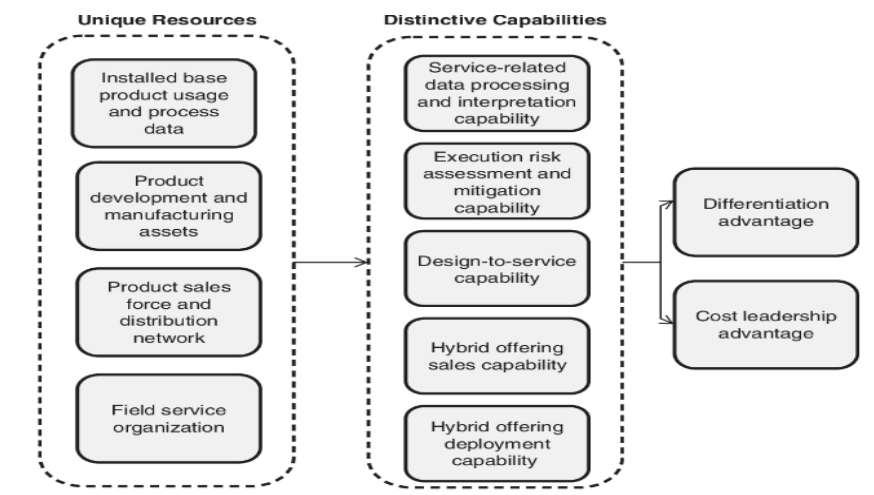


Figure 9. Manufacturer-Specific Resources and Capabilities for Successful Hybrid Offerings. (Renartz and Ulaga, 2011.)

The study highlights that manufacturing focused companies may successfully implement "hybrid" offerings and provide additional value to customers by adopting a customer-centric mindset, establishing a strong organizational culture, and encouraging open communication and collaboration across departments. Junttan needs to also change their way of thinking to match better to support their customers processes if the vision is to boost service business. Service agreements are one way of giving the additional value for the customer.

Services are a way to escape the product commoditization trap; for example, in the elevator industry, companies like Otis and Kone enjoy maintenance service margins of 25–35% compared with a margin of approximately 10% for new equipment (The Economist, 2013.) This is one of the key reasons why Junttan wants to develop their service offering because new piling machinery sales profit margin is relatively small compared to services.

Research shows the importance of having clear strategies clear instructions to whole organization when manufacturing focused companies are moving their interest towards service orientated business model. In fact, design and size of the organization should be the structure for development of service processes. (Edvardsson, Gebauer, Gustafsson and Witell, 2010.) Therefore, Junttan needs clear internal instructions and training to even start new service operations. Focus point of the thesis and the development project of service agreement was in internal instructions.

The way successful service providers adjust their resource levels during the transition from manufacturing-based to service-based offerings. This study investigates how changes in the use of resources, such as personnel and organizational structures, contribute to successful service delivery. Successful service providers frequently invest more in training staff members, recruit individuals with specialized service-oriented skills, and form cross-functional teams to ensure efficient service delivery. Additionally, they invest in tangible assets such as service facilities and vehicles to facilitate service delivery. Study demonstrates that Manufacturers from a variety of industries, such as IBM, CAT, and the Rolls-Royce have avoided the product commoditization trap and gained increasing benefits from their transition to services. (Huikkola, Kohtamäki and Rabetino, 2016.)

The study examines with four topics the whole process in which companies change from selling products to providing services is called servitization. The first topic of the study is the conceptualization of servitization, which involves defining and comprehending the servitization process. The second stream of research investigates the determinants of servitization, such as consumer demand, technological innovation, and competitive pressure. The third topic concentrates on the obstacles and challenges associated with servitization, including organizational culture, dearth of expertise, and opposition to change. The fourth and final topic examines the results and benefits of servitization, such as increased customer loyalty, revenue growth, and innovation. (Benedettini, Burton Gebauer, Kowalkowski and Raddats, 2019.) The study is a perfect example of which kind of process it is for Junttan to move from product orientated to company to service orientated company. Service agreement development program is one step for that. Development job for service agreement includes all the same topics which are carried out in the Servitization: A contemporary thematic review of four major research streams study.



Figure 10. Servitization offering levels. (Elkin, 2019.)

3.2 Service business possibilities

The largest construction machinery manufacturer in the world measured by revenue and market capitalization is Caterpillar more familiarly knowns as CAT, is moving more towards service orientated company with their Services Go-To-Market strategy. Their own studies have shown that 95% of possible services can be achieved if good relationship is built with the customer and then it is just extending the relationship. (Figure 11.). Approximately 30% of Caterpillars yearly revenue came from spare parts and 10% from different services in 2019. With the ideology to move business focus to be more service orientated their focus is to increase spare parts and services combined revenue to be over 50% of whole Caterpillars yearly revenue. One of the largest Caterpillar retailer Finning International Inc. have reported that roughly 80% of machines they sell go with remote connection in 2019 compared to 2016 value was 68%. (Hufford, 2019.) Growth comes from the possibilities which can be offered to the customers. Component manufacturers have developed their products and there are more and more data available from all kinds of components of the machine. This have eliminated the bottleneck of information. Companies have to plan carefully which data is relevant to offer for machine user and which data should be connected to a service. *Example machine informs*

oil level low machine user gets without service. *Example:* Machine gives an error code to solve it operator have to call official retailer or manufacturer to get information what to do to solve error. Benefits for the customers is that they get help very easily with just a phone call but on the other hand they are forced to co-operate with the service provider. The idea is to provide right amount of information which is available.



Figure 11. CAT Services Go-To-Market Strategy. (Doyle, 2019)

When different services provided by retailer or manufacturer are optimized well, they will boost productivity of the customers machine, which leads to that customers are more willing to invest into services. Properly optimized services will support each other and create loop of revenue from customer to manufacturer if customer gets benefits of the services. *Example: Regular oil cap costs for the customer 20€/pcs. It is simple and just keeps all kind of dirt out from oil tank. On the other hand, oil cap with oil level sensor would cost to customer 50€/pcs. Customer would also need service internet connection for the machine to get real time sensor data which would cost 20€/month. Then customer might want to get more benefit out of the service internet connectivity and upgrades engine coolant cap to have sensor as well.* To get maximum perks about different services customers are forced to have a combination of services and that is why service agreements include many service features in the same package. Machine manufacturers achieve regular revenue from customers by just providing services which will help customers main operations and, in that way, attract customers to use the services. Service agreements are a perfect way to achieve regular revenue easily because in service agreement the customer "promises" to use service providers services for contract time.

When the technology of machines improves it creates more possibilities to service and increases the usability of piling machine. *Example: Data provided by different sensors makes it easy for customer to know when oil or coolant needs to be added.* Piling machine operator can focus on the real productive operations of the machine when the information of the needed maintenance comes automatically. It could be said customers are more willing to pay for information and amount of information goes up when technology innovations of the machines go further.

For customer a dreamlike situation would be that piling machines runs 24/7 without malfunctions and piling contractor could just focus on piling. Productive work in piling jobsite is when piling itself

is done. All pauses to piling should be avoided and productivity and number of pauses is dependent on how well machine is maintained. *Example of piling efficiency: Foundation site has 500 piles to be driven to ground. Piling contractors get a fixed commission of 1000€ if piling is done within five working days. After five working days contractors have to pay a 100€ fine for every day they are late. Both contractors have the same piling machines with the capacity of 100 piles per day.*

Contractor 1: Well-maintained piling machine with service capabilities.

$$\alpha = \text{piles to be driven} = 500 \text{ piles}$$

$$\beta = \text{machine capability} = 100 \text{ piles/day}$$

$$\gamma = \text{machine productivity} = 1 = 100\%$$

$$\beta * \gamma = \alpha$$

$$100 \frac{\text{piles}}{\text{day}} * 1 = 500 \text{ piles}$$

$$\frac{500 \text{ piles}}{100 \frac{\text{piles}}{\text{day}}} = 5 \text{ days}$$

Contractor 2. A poorly maintained machine gets faults because oil level is low and coolant level is low. The machines productivity is 75%.

$$\alpha = \text{piles to be driven} = 500 \text{ piles}$$

$$\beta = \text{machine capability} = 100 \text{ piles/day}$$

$$\gamma = \text{machine productivity} = 0.75 = 75\%$$

$$\beta * \gamma = \alpha$$

$$100 \frac{\text{piles}}{\text{day}} * 0.75 = 500 \text{ piles}$$

$$\frac{500 \text{ piles}}{75 \frac{\text{piles}}{\text{day}}} \approx 6.67 \text{ days}$$

Conclusion: The efficiency and productivity of Contractor 1 is on another level compared to Contractor 2. Contractor comparison table (Figure 12.) shows numerical differences between the two contractors which are easily comparable. Both contractors were able to finish piling but Contractor 1 had fewer overall costs and more money earned from one piling job site. On top of numerical differences between contractors there are also differences which cannot be easily calculated like stress levels, frustration etc.

	<i>Contractor 1</i>	<i>Contractor 2</i>
Piles driven:	500 piles	500 piles
Workdays spent	5 days	6.67 days
Money earned	1000€	800€
Money earned per workday	200€	119,9€

Figure 12. Contractor comparison.

4 MAINTENANCE OF PILING MACHINE

4.1 Maintenance methods

There are different kind of maintenance methods for piling. Some methods work more better for other companies depending on the company structure and mind set which is set. Big companies are not planning to own piling machinery for a long time, and they might not be very interested in its maintenance. On the other hand, big companies might have better resources to maintain their equipment.

4.1.1 Reactive maintenance

Reactive maintenance is practice when maintenance is only done after normal working conditions have failed. Maintenance operation follows routing: equipment failure, identification of the problem, repair or replacement of the problematic component, testing the equipment and machine is working or not depending on if diagnosis and maintenance was successful. Reactive maintenance can be costly and result in work stoppages or slowdowns.

4.1.2 Predictive maintenance

Past data is used to estimate when a part will fail and those parts are replaced based on these estimations before they fail. Predictive maintenance is more based on condition of machinery. It includes monitoring productivity and equipment condition during normal operations to decrease number breakdowns.

4.1.3 Preventive maintenance

Preventive maintenance is the regular and routine repair of equipment and assets in order to keep them functioning and avoid costly unplanned downtime due to unexpected equipment breakdown. An *example*: piling machines preventive maintenance is doing an oil change every 500 hours. While preventive maintenance can be useful in some situations, it is important to remember its limitations. Limiting factors of preventative maintenance can be that equipment failures may not always be prevented by preventive maintenance. This is since maintenance duties are performed on a fixed schedule, regardless of the equipment's actual condition. Second one is that preventive maintenance method neglects some real issues. It relies on routine maintenance duties rather than addressing

specific equipment issues. Preventive maintenance overlooks real problems that would need maintenance. This can lead to machine malfunctions and other problems that could have been avoided if the root issue had been addressed sooner.

4.1.4 Preventive vs Predictive

Primary differentiation between preventive and predictive maintenance is that predictive maintenance does not have schedule and it is not routine based. Predictive maintenance is based to best practices which have been learned. Predictive maintenance reflects the actual state of the equipment.

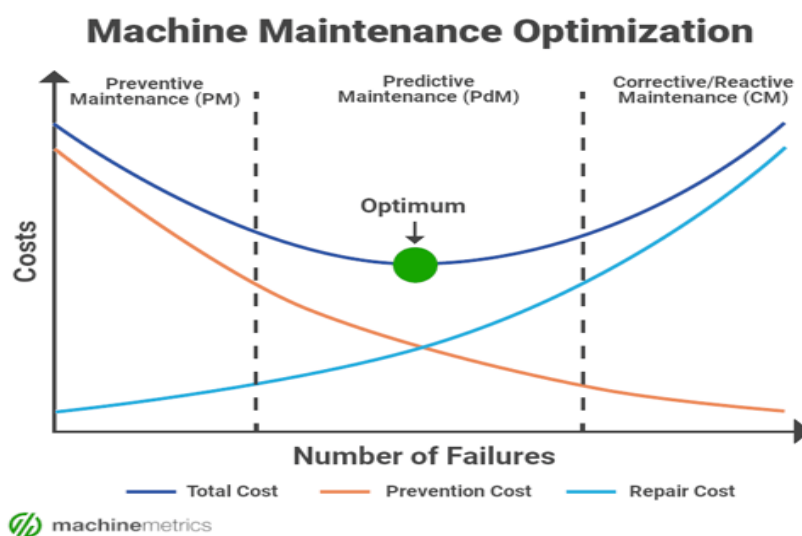


Figure 13. Machine maintenance optimization. (Bither, 2021)

Optimum maintenance method is predictive maintenance method for the best overall productivity and efficient use of machine and total operating cost. Predictive maintenance method is overall the choice for piling contractor. It allows piling contractors to make smarter utilization of their maintenance resources, cut expenses, and lessen the effects of unplanned downtime on their operations. Machine maintenance method optimization (Figure 13.) expresses that total costs are the lowest when using predictive maintenance method.

5 LIFECYCLE SERVICES

5.1 Lifecycle services generally

Lifecycle services for piling machines are a variety of services and support provided by the manufacturer, retailer, or an authorized service provider to ensure that the machine performs optimally for the duration of its lifespan. These services can include pre-sales consultation to assist customers in selecting the appropriate machine, installation and commissioning services, operator training, regu-

lar maintenance and repair, spare parts and consumables, upgrades and retrofits, disposal and recycling services, and disposal and recycling services. The objective of these services is to maximize the machine's value to the customer and reduce the possibility of failures and downtime of piling.

5.2 Lifecycle services in Junttan Oy

Junttan offers different kind of lifecycle services for their customers to help maintenance of piling machinery. Lifecycle services are divided into two sectors contract-based and non-contracts based.

5.3 Contract based lifecycle service

Contract based lifecycle service is an agreement between Junttan and customer about specific services. Contract based lifecycle services are focused on preventive maintenance and predictive maintenance depending on what is the focus point of that service. Contract based lifecycle services are combinations of different services provided by Junttan.

5.3.1 Lifecare/Lifecare+

Lifecare is contract based preventive maintenance service. It includes maintenance operations that are scheduled under the Junttan preventive maintenance program such as oil changes, filters change and lots of visual inspections. All the operations are done by Junttan service technician. Lifecare+ includes more parts in the scheduled maintenances. (Appendix 5.) Lifecare brochure has features of Lifecare agreement listed.

5.3.2 Junttancare+

Junttancare+ is contract based predictive maintenance service which includes reminders about scheduled maintenances of piling machinery and spare part shipments for those scheduled maintenances. Operations of the scheduled maintenances are done by customer themselves. Junttancare+ also includes remote connection to the Junttan technical service and annual audits which are done by Junttan technicians. Based on the audit reports customer gets recommendations which parts are worn out and should be replaced or repaired. (Appendix 6.) Junttancare brochure is marketing material for Junttancare+

5.4 Non-contract-based lifecycle services

Non-contract-based lifecycle services are not related to any contract or agreement between Junttan and customer. These services are more individual services and customer gets only what is being offered at that time.

5.4.1 Technical support

Piling machines have capabilities to be connected to Junttan technical support center which can track in real time all the parameters from different sensors and detect remotely problems.

5.4.2 Auditing

Piling machinery auditing service is inspection of the piling machinery and its condition. After audit customer gets auditing report which includes advices about maintenance and recommendations for

the parts to ensure piling machinery secure and functional. Safety of piling machine increases when required fixes are done according to auditing report. Junttan can not put piling machines to prohibition of operations even though piling machine lacks safety features.

5.4.3 Training service

Training service is service to customer which want start using their piling machinery or optimize the use of piling machinery. Topic of the training can vary a lot following are just few examples: safety training, scheduled maintenance training and work method optimization training.

6 PROFITABILITY OF THE SERVICE AGREEMENT

Primary function of offering lifecycle services is to help piling machinery owners by easing their load from service operations and especially contract-based lifecycle services can build long lasting, trusty relationship between the customer and Junttan as service provider. The most important thing for Junttan is that providing contract-based lifecycle services is positive business. Overall income must be greater than the overall costs. Contracts need to be agreed that if contract is terminated it would still be profitable business.

(Figure 14.) is example to show follow up of contracts profitability. Example explains if contract could be terminated without consequences in certain periods of contract it would be unprofitable. During contract period month one to three profitability of contract is positive, small costs and invoiced income is greater, so contract is profitable. During month four big maintenance increases cumulative costs of the contract to be higher than cumulative income and this is very bad situation from profitability point of view. During month 5 income and costs are even so the situation isn't still ideal from business point of view. Months six and seven are back on track and business is positive. For the service provider it is essential to be able to manage contract termination because otherwise some customers could take advantage of it.

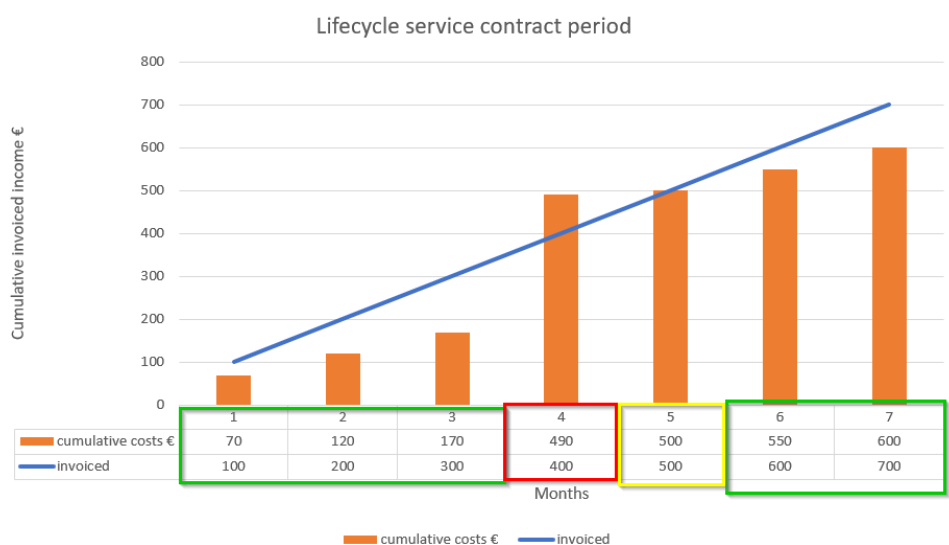


Figure 14. Lifecycle service contract period.

6.1 Agreement terms

Situation when service contract is unprofitable should be avoided in any case but sometimes those situations are not avoidable. The most important aspect still is that at the end of the contract it would be profitable because aim is that none of the contracts is terminated before contract period ends. Making sure the contract remains profitable even if it is terminated is to have limitations in the contract.

6.1.1 Notice period

Firstly notice period is one limitation which could save contract being from unprofitable to be profitable. If previous example had a two-month-notice period and the contract is terminated in month four by customer the contract would still continue till month six and then contract would have been profitable.

6.1.2 Contract content

Second one is the contract's content. It is mandatory to evaluate which parts or operations are included in the contract based on their costs and importance to customer. If customer is very interested in specific components, it is vital to acknowledge it when the contract is made. If customer wants additional parts which are not listed in the contract those are additionally invoiced. Same goes to service operations. Junttan does not offer extra help for installation or technical support if it is not listed in the agreement. One additional Contract related restriction is to offer services only in certain period of the contract. As an example, if auditing is promised to be annually it can be limited that Junttan suggest time period when it is possible during contract period.

6.2 Lifecycle services by other companies

Lifecycle services are very common by other companies who retail or manufacture some kind of machinery. There are huge variance how different companies handle their operations. The interviews of the representatives from two companies were interviewed and their experiences regarding contract-based lifecycle services were discussed.

6.2.1 Avesco

Avesco Oy is Avesco groups Finnish subsidiary, and their main business is to be the retailer and the service provider for Caterpillar, more familiarly CAT machinery. Areal Service Manager Henri Lappalainen, Sales Manager Hannu Jurvelin, and Service Sales Manager Pertti Karppinen were interviewed about different aspects of the service operations in Avesco's point of view. Avesco follows CAT instructions which kind of operations can be offered but they have ability to modify their offerings to suit better local customers. Avesco offers three kind of service agreements: easy parts, easy service and total maintenance agreement. Easy parts is spare parts agreement with customer which includes spare part deliveries and notification for scheduled maintenances. Customer gets email "your CAT xxx needs scheduled maintenance in 50hours. Customer has three options 1. Order parts 2. Order parts & service 3. Don't order parts. When customer clicks Order parts, customer inputs address where parts should be delivered by Avesco. Ordering parts & service includes same thing as ordering parts but on top of that it connects customer to a field service manager who can schedule

together with the customer when service is happening. If customer doesn't have a new worksite upcoming, it can choose option Don't order parts. Ideology for this service agreement is that customer gets small discount for preventative maintenance parts but does not pay for the agreement itself. Easy service agreement includes part deliveries for the scheduled maintenance and installation job. Customer is contacted 50 hours before the scheduled maintenance by the field service manager about when to have the service and where. Customer knows exactly how much scheduled maintenances will cost for it during specific time period because they are calculated in easy service agreement. *Example:* CAT xxx 500h maintenance costs 100€, 1000h maintenance cost, 150€ etc. No matter if maintenance job takes one hour by service technician or eight hours. Customer is invoiced by the agreement job. All the extra work, parts and travelling costs to far away are invoiced on top of the agreement. Last one is total maintenance agreement which includes everything from easy service but in addition it also includes all other maintenances which are not included in scheduled preventative program. Pricing for total maintenance agreement is even more fixed than easy service because it also includes travelling expenses in the agreement. Avesco's principle for service agreement is that agreements customer does not for the agreement itself, not from machine usage hours all agreements are framework agreements. Previously service agreements have been monitored and invoiced by machine usage hours or calendar periods. Customers did not like it because it pressurized them to have confirmed worksites to even consider service agreements. Avesco representatives were interested in Junttan service agreements, and their opinion was that Lifecare agreement has very heavy structure for the piling machine owners who don't have guaranteed worksites for long times. 90% of machines which Hannu sells have service agreement because customers don't invest money for the agreement it just gives them opportunities:

- Easy parts: discounted maintenance parts
- Easy service: fixed preventative services and parts
- Total service agreement: fixed price for all maintenances and scheduled maintenance parts.

Avesco provides also service agreements proactively by following machines usage and contacting customers. Henri, Hannu and Pertti agreed that it is very difficult to compare Junttan and Avesco because the number of machines is so different. Most of their service actions are based on field service for customers. They wanted to point out "it is nonsense to make too complicated agreements because it scares customers and gives just headache to the organization to run operations around them."

6.2.2 Wihuri Oy Tekninen Kauppa

Wihuri Oy Tekninen Kauppa is one suborganization of Wihuri Oy which sells and leases different kind of machinery mainly with business-to-business principle. Wihuri Oy Tekninen Kauppa is divided into different sections such as agriculture, environment, gardening & construction machinery and lifting equipment & indoor machinery.

Aftersales Manager Tomi Peltonen was interviewed, who is responsible of lifecycle services and contracts in Wihuri Oy Tekninen Kauppa. Tomi explained that how they run lifecycle services depends very much on which machine brand they are representing, and which kind of possibilities machines

technology can offer. "We are linkage between manufacturer and end customer. We can provide services which manufacturer provides us and we can modify and own these operations by ourself". Wihuri's brands which they retail and market have provided lifecycle services tens of years. For example Linde forklifts had lifecycle services already 1998 when they started retailing. The most of Wihuri's products which they sell have some kind of financial agreement or leasing which includes automatically lifecycle services. Especially in lifting and indoor department it is very uncommon that companies would buy forklift without knowing who is going to handle all service operations. Tomi wanted to notify that there is huge variance in their customers some are just one man wheel loader contractors and some of their customers are huge corporations which buy 20 wheel loaders per year. This is why not all the contracts which Wihuri provides are identical. Tomi mentioned that customers have also different needs for example one man contractor who buys excavator have confirmed his worksite for the next 5 years and he makes continuously invoiced contract which includes all scheduled maintenances and consumable parts. Another customer might order 10 wheel loaders for snow removal but they have no information is it snowing in winter and do they have work for the loaders. This kind of customers are not usually interested in continuously invoiced contracts. More suitable are framework contracts which allow them to buy specific kind of spare parts in specific price or maintenances in specific price or condition. Tomi explained that it is important to understand customers need and how they run operations when contracts are provided.

Wihuri has own agreement organization which job is to make new agreements, follow and update old agreements. When new machine is sold with some kind financial contract or with leasing agreement salesperson can offer standardized service agreements as well. If customer is not happy for standardized offering the agreement department will start discussion for modifications of the service agreement. Also, If customer don't take any leasing or financial agreement the responsibility from service agreement goes to the agreement department who negotiates together with customer different service methods. The agreement department also follows the invoicing and profitability of the service agreements. When agreement is done it is their responsibility to put all parameters to ERP-system to schedule invoicing, add maintenances etc. When incomes from invoicing and costs are starting to land for the contract it is easy to follow how profitable individual service agreements are. Bonus employees who work in agreement department are SSR=Service Sales Representatives. Service Sales Representatives do the proactive service sales in field who can also modify agreements on the go and discuss together with customer with their needs in field conditions.

Pricing calculations for agreements also come from agreement department because they have the best knowledge about profitability of agreements. Tomi explained that some of their brands have own maintenance calculators which gives estimations how much maintenance would cost in certain time period. These calculators are helping tools when pricing of agreement is negotiated.

Lastly, it was discussed how their service agreement has developed during the years. The answer was very straight and simple "They have been simplified and standardized." "It is very difficult for the organization to make any new contracts and specially to follow up them if all agreements differ from each other."

7 PROJECT ITSELF

7.1 Step by step instructions

One of the most important aspects for the development process of service agreements was to reduce as much uncertainties as possible inside Junttan corporation. When Service agreement Department was launched 2022 with an aim to commercialize service agreements more. Quickly more and more agreements were made but then different departments of Junttan corporation were having question marks above their head. How, who, when, what and why. These are the questions to in which internal step by step instructions are supposed to answer.

7.1.1 Sales process

Sales process of service agreement is divided roughly into two categories. New agreements and agreement renewal. New agreements are made when customer is buying Junttan piling rig used or new one. The seller of the piling rig can offer standardized service agreements for the customer when deals are done. Junttan service agreements can also be closures for the deal if customer have uncertainties how to maintenance rig, service agreement is good solution for that. If customer is not satisfied with the standard agreements offering the seller of piling rig makes co-operation with Service Department to modify service agreement to fit customers desires. Step-by step instructions for new rig sales process are shown in (Figure 15.).

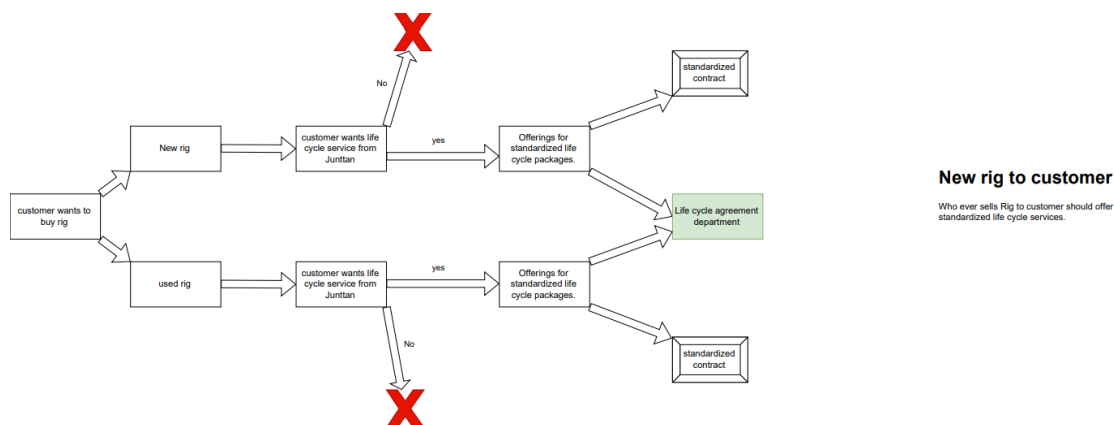


Figure 15. New rig sales.

Proactive agreement sales is performed by Sales Department or Service Department depending who is in contact with the customer who does not have agreement already. The key point of Proactive service agreement sales is that whoever contacts customer about service agreements has enough background information gathered to convince added value which service agreement would give. *Example: Customer wants that their piling machinery is always in top shape and safe, but they have their own maintenance organization. Proactive sales: We could offer you service agreement Junttancare which includes annual audit, audit & safety report, remote connection for piling rig and on top of that spare part deliveries for scheduled maintenances.* (Figure 16.) If proactive sales had been offered yearly maintenance by Junttan it would not have benefited the customer because they

already have their own maintenance organization. It is important to know customers' needs and focus on them and ease the load from maintenance.

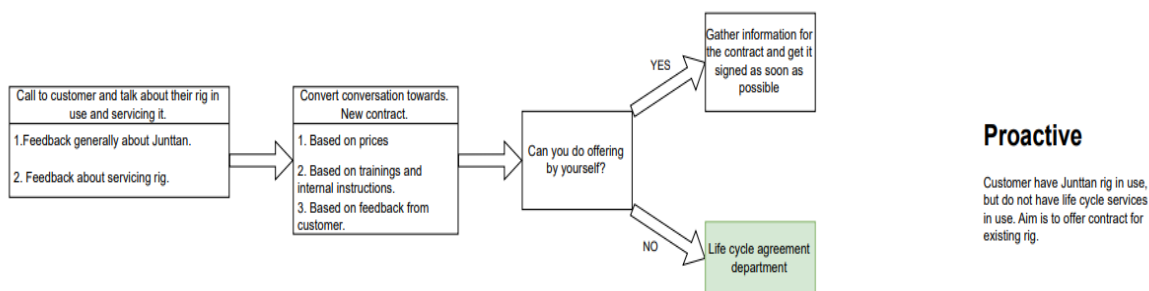


Figure 16. Proactive agreement sales.

Agreement renewal process (Figure 17.) is also co-operation process between Sales Department and Service Department. They gather the follow up information from previous agreement and based on that information contact customer to renew agreement with same terms or modify it to fit customers desires. If it is possible to meet customer face to face it makes agreement renewal process easier because then it is easier to get feedback from previous agreement and push for decision making to new agreement.

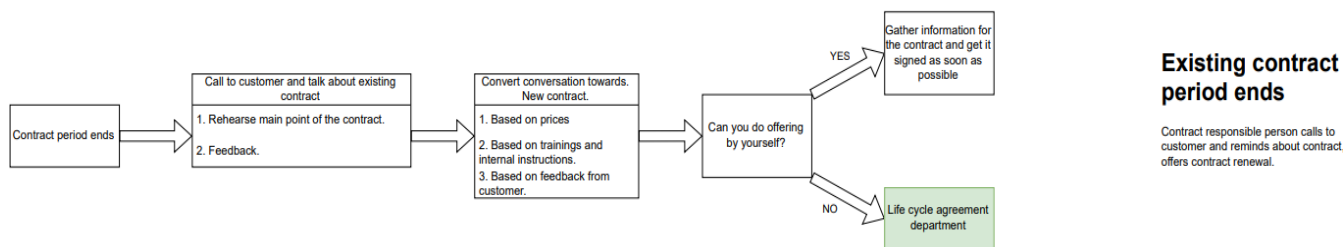


Figure 17. Existing contract period ends.

7.1.2 Service agreement follow up

When contract is made the follow up process begins. It includes all the operative functions for Junttan Oy and its subsidiaries. The following chart explains with different steps how service agreements are followed in operational level. Both lifecare and Junttancare agreements are focusing on scheduled maintenances which are supposed to be made regularly followed by hammer of rig usage hours. Junttan machinery is connected to closed IOT-server which gives data parameters from PDM-system of the rig. For this IOT-server each machine which have agreement are set scheduled maintenances and automated message called IOT-ticket. IOT-ticket includes necessary information about the scheduled maintenance and agreement *Example: Junttan PMx22 #1999 has reached 900hours. Next scheduled maintenance includes JPM1, JPM2 & HPM1 services. Junttancare agreement.* This kind of IOT-ticket is sent to Junttan agreement email box and the primary agreement

responsible person. Primary agreement responsible person is set in agreement together with customer depending on which company have made agreement and where machine operates commonly. Primary agreement responsible person gathers the information from IOT-ticket and calls to customer to remind customer about agreement, date for the service and offering extra parts or maintenance help from Junttan. After customer is contacted and necessary information for the order is made same person makes customer order to ERP-system. Summary how customer order should be made is in (Appendix 8.) internal training. All the scheduled maintenance parts are updated to ERP-system so making customer order is very fast forward process. If customer orders extra parts and person who is responsible for creating the order does not know which part numbers customer wants Junttan Oy spare part organization will help. If the primary agreement responsible person is out of work because of illness or holiday. Anyone who have access to Junttan agreements email box can take responsibility to open IOT-ticket and start contacting customer. Withing two days every IOT-ticket must be opened and proceeded to customer order in email and ERP-system.

The most important thing in operational follow up process is that customer is contacted by someone if they have service agreement. Customer have invested money to agreement, and they have own expectations about agreement no matter which kind of service agreement they have made. Fulfilling customer expectations and exceeding them keeps customer happy. Keeping customer happy helps other agreement related operations such as agreement renewal process. It is very likely that customer who have been very satisfied of the service agreement would renew the agreement after agreement period comes to end. Also, customer who buys new piling machinery would consider Junttan piling machinery more likely when they have been satisfied how easy the maintenance was with previous piling machinery which had service agreement. On the other hand, customer might be unhappy for the service agreement if they would not get what is expected *example: customer is contacted late and scheduled service time is exceeded or customer does not receive parts which were expected.* This kind of situations have to be avoided because while it creates tensions between Junttan and customer it also creates uncertainties and hassle internally. Service agreement follow up chart has step by step instructions for the internal use which are equally relevant to all Junttan corporation companies. (Figure 18.) is guidance for the follow up process.

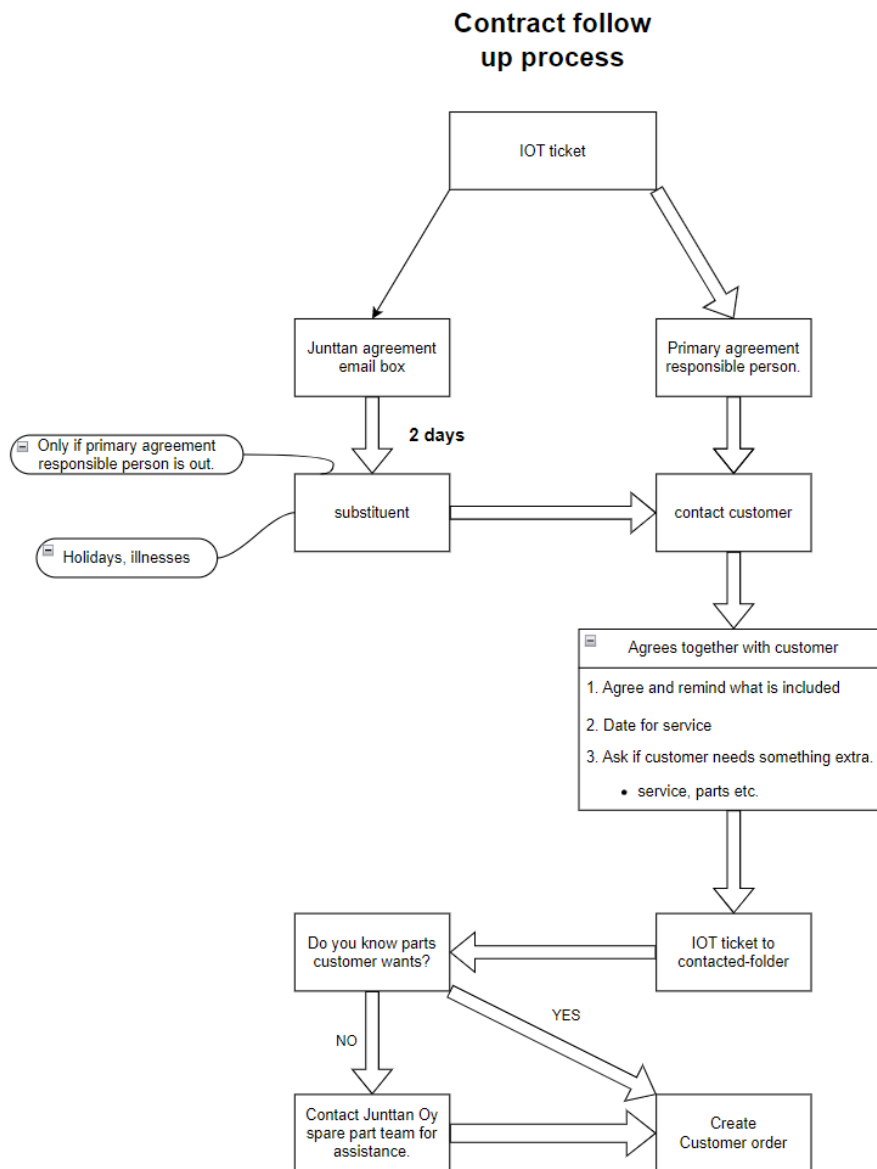


Figure 18. Service agreement follow up chart.

7.1.3 Who are involved in service agreements?

The focus is to run most of the operations by Junttan subsidiaries and Junttan Oy would concentrate to developing the operations and give assistance for the subsidiaries. Junttan Oy would also handle operations in Finland because it is geographically and language wise the most effective. Internal organizational instructions give answer which departments of subsidiaries and Junttan Oy are involved running service agreement operations.

Expectation is that subsidiaries could offer lifecycle services for the customers on their own in their region. For all subsidiaries same departments which are involved in running the operations for lifecycle services. First part is Service Department operations which is responsible of handling all the operations which are "deliverables" in the service agreement. "Deliverables" can be either some kind of service for the customer or parts depending of which kind agreement is. Field service Department of subsidiaries are focusing to do all maintenance work and auditing for the customers. From piling machinery service or auditing service technician provides report to customer and to field service

manager. Field service manager reviews the report and makes decisions for the follow up. *Example:* Auditing report gives information that some safety features are not working for the piling rig. Field service manager makes quotation to customer for new parts or service to fix safety features. (Appendix 7.) gives an example of auditing report. The Second Service Department operation is spare parts. Spare Parts Department is responsible to make customer orders and quotations of the spare part sales for the customer and import sales and quotations to ERP system. Spare Parts Department is also helping Field Service Department to find correct parts for the customer equipment. On the other hand, Field service opens opportunities to Spare Parts Department to sell more spare parts. Ideology is that different departments would support each other and have same aim in the end: Make customer happy, ease customers load from service operations. Internal service operations chart (Figure 19.).

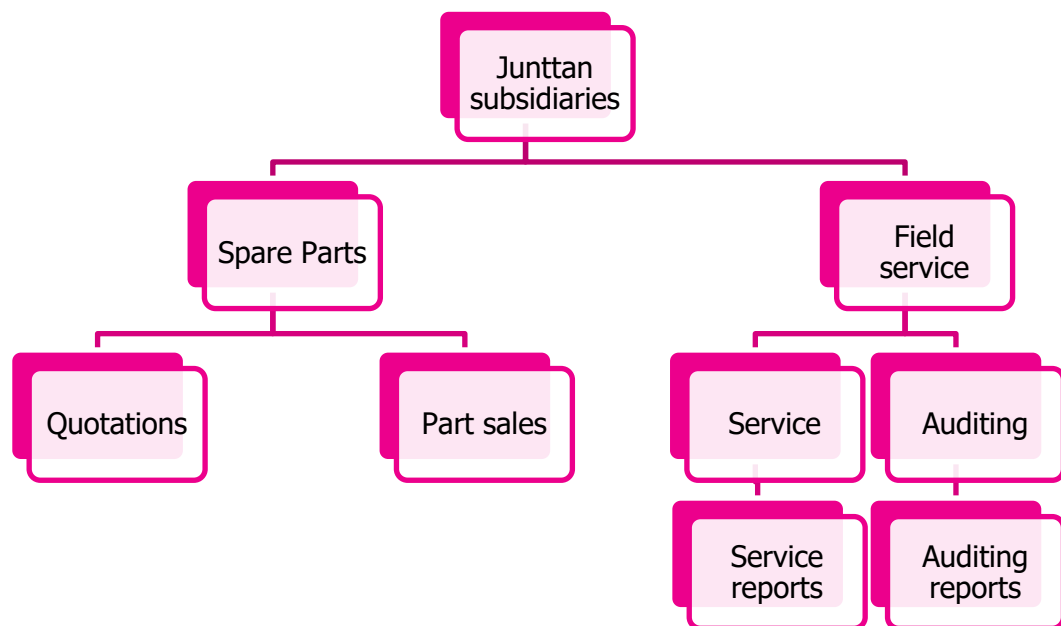


Figure 19. Subsidiaries service department operations.

Subsidiaries responsibility is also to handle background operations related to contracts. Finance and invoicing are focusing on financial operations behind agreements. When service agreement is made Finance and Invoicing- Department schedules invoices from the operations are mentioned in the agreement. *example:* 1000€ monthly invoicing 1st day of the month and payment term is 30 days net. Finance and Invoicing schedules agreement invoices to ERP-system and sends the invoices to customer. Finance and Invoicing- Departments responsibility is to allocate incomes and cost to agreement. Incomes for the contract are scheduled invoices from agreement, spare part & service sales to customer followed by other agreement operation. *Example:* Field service manager calls to customer and sells new parts based on auditing report. This kind of extra sales would haven't been possible without the service agreement itself which includes auditing so this extra spare part sales incomes are allocated to agreement. Also costs related to agreement operations are allocated to contract. *Example:* Service technician makes audit to customers piling rig which creates labor cost, traveling cost to customer destination etc. Finance and Invoicing- Department is in charge of the profitability follow up of the agreements. Follow up includes two sections which are financial follow

and status follow up. Financial follow up means Finance, and Invoicing Department calculates how profitable individual service agreement is based on all incomes and costs allocated to the agreement. Status follow up means observing agreements validity. When agreement period is coming to end it is important to inform people who are responsible for contract renewal. Also if contract is terminated by customer it is Finance and Invoicing- Departments responsibility to update that information to ERP-system.

As previously introduced, there are three different ways to create agreements:

1. New rig sales,
2. Existing agreement period ends and
3. Proactive agreement sales.

These operations are performed by Piling Rig Sales Department. The reason for this is that they contact very frequently and could boost their new rig sales at the same moment when they talk with customer about sales agreements. Idea is that Sales Department makes co-operation with service units whenever it is time to renew contracts because Service Department have knowledge how operations went with the previous contract. Internal summary chart for Finance and Invoicing Department as well as Sales Department is shown in (Figure 20.).

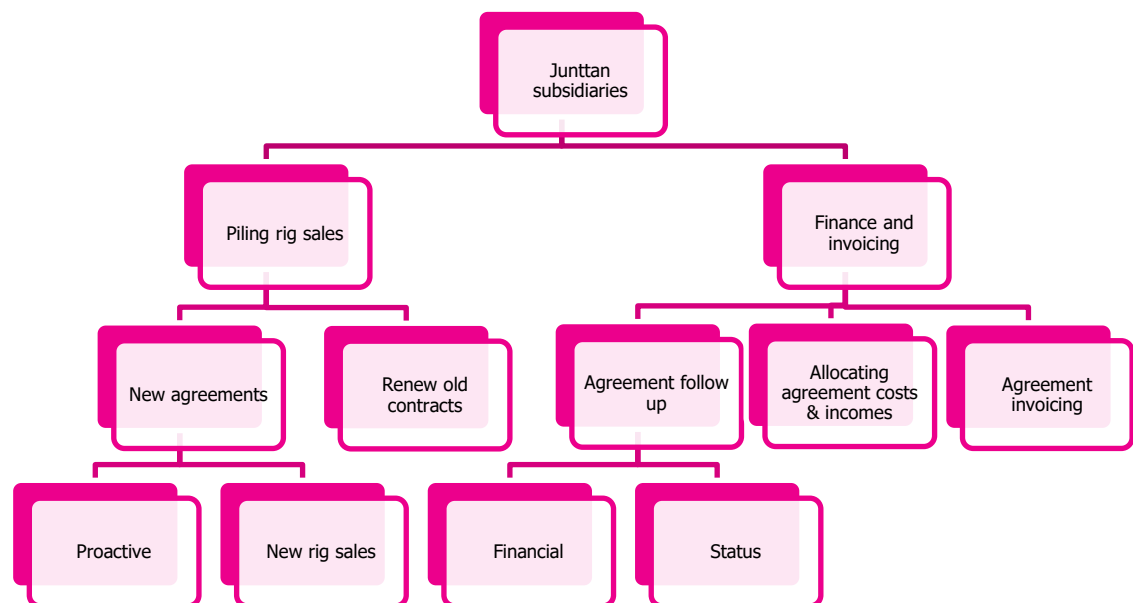


Figure 20. Junttan subsidiaries Sales and Finance and Invoicing Department.

Junttan Oy main responsibility is to manage from upper level all the operations related to service agreements. Service agreements are quite new topic for Junttan so there are lots of questions from subsidiaries and it is important that Junttan Oy can answer and manage those questions. That is why responsibility to answer for each question is divided into different departments depending on topic of the question. Junttan Oy Parts Department is responsible for answering all the questions when it is unclear about parts which customer is looking for. It can be extra parts which customer is looking for or scheduled maintenance parts which need to be updated to ERP-system.

Field Service Department is responsible for answering questions related to auditing and field service of piling machinery but on top of those Junttan Oy Field Service Department can offer help for auditing or field service if subsidiary has temporal lack of labor to run operations.

Junttan Service Agreement Department is taking care of all questions related to agreement itself. When ever subsidiaries representative have uncertainty about agreement terms or how operation should be managed Service Agreement Department will assist then. Whenever customer is not satisfied of standard service agreement and request some modifications, these have to be approved by Junttan Oy Service Agreement Department because it will affect all other operations around it.

Junttan Oy's managerial responsibilities by departments (Figure 21.)

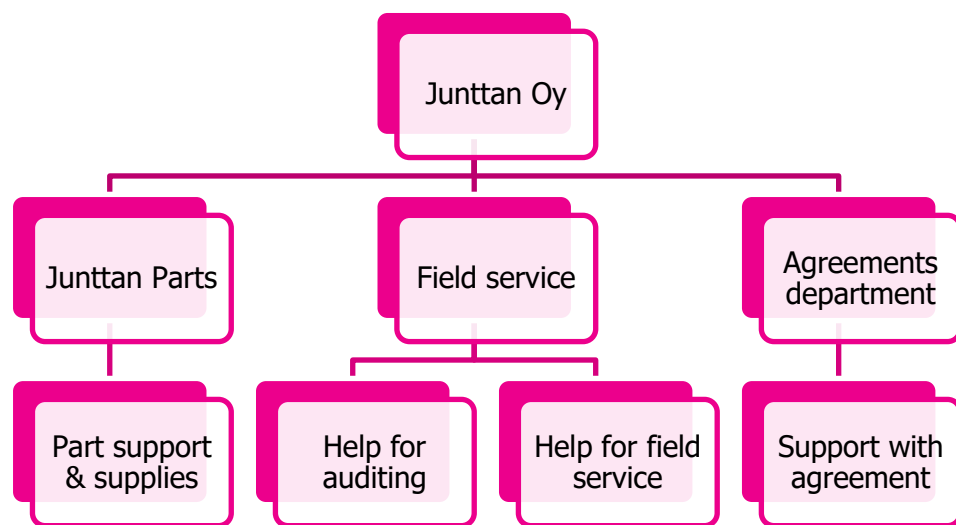


Figure 21. Junttan Oy department responsibilities.

Scope is that service agreements become more popular in the future for Junttan rigs and major percentual amount of Junttan rigs would have some kind of service agreement clear division in workload becomes more important. All the responsibilities around service agreements have to be divided into some departments not to single persons because employees change, and positions are not permanent.

In order that development work for service agreements is possible it is mandatory that there is regular open communication about agreements. It is expected that most of the operations and new service agreements are made by subsidiaries because only small portion of Junttan machines are located in Finland. Good solution for open communication is teams channels and weekly meetings between Junttan Oy and subsidiaries in which one topic for the future is to talk about service agreements and how it is going around them. Relevant key performance indicators for the follow up should be decided later when more information of service agreements is available. Then comparing

status of agreements is easier during weekly meetings.

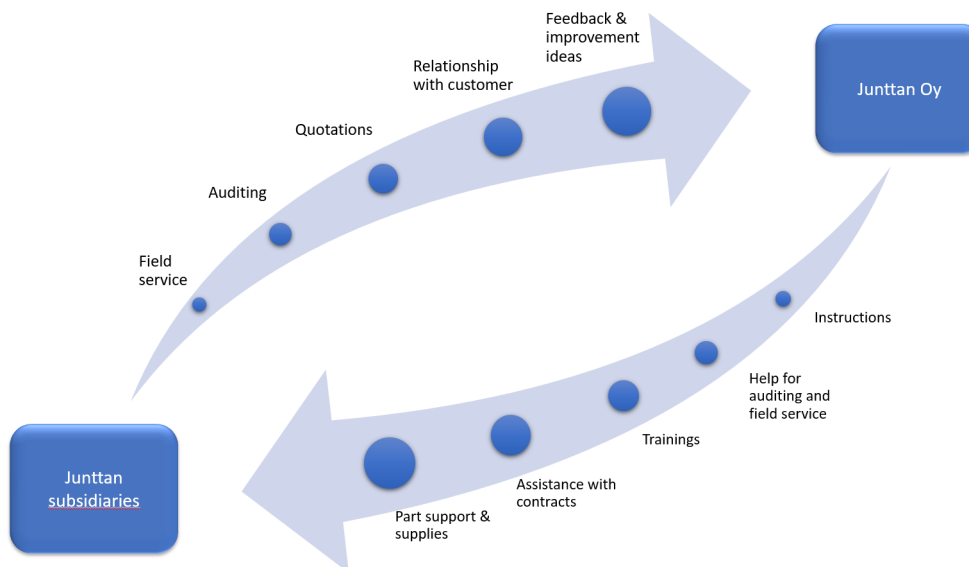


Figure 22. Service agreement responsibility division summary.

8 CONTRACT TEMPLATES

Harmonizing processes was one of the most important topics for the thesis. All the documents should be equal to each other because follow up work and making service agreements becomes much easier. Service agreement templates are the English version templates for new agreements which will help the sales process of new agreements. Personnel who are responsible of making new agreements do not anymore need to make new agreements from scratch but instead they can open template and start to fill customer related information. Templates will simplify the follow up of the agreements because contents of the agreement are always in same order. *Example: Field service needs to check from agreement is some part included in agreement. Field service knows that agreement content is listed in section 5 of agreement.* The look for customer is more professional when every agreement looks visually identical and pleasant. Templates for current contract-based lifecycle service offering are shown in (Appendix 1.) Junttancare template and (Appendix 2.) Lifecare template.

9 CUSTOMER PERSPECTIVE

Offering of service agreements is made for customers of Junttan so it is important that customers would be happy to use service agreements. Representatives of one Junttan's customers were interviewed about their experience about Junttan service agreements. Unfortunately, it was not possible to interview any customer which do not have service agreement in use. Feedback from a customer which has not any service agreement could have said why Junttan service agreement is not good enough for their company to be invested in.

The interviewed customer company of Junttan owns three Junttan rigs and Junttan hammers. Representatives of customer told their experiences of Lifecare+ service agreement. The company wanted to stay anonymous, but representatives respectively told their experiences around Junttan

service agreement. Company has all kind of construction operations, and their machinery fleet includes other kind of construction machinery not only pile drivers. Company has own maintenance organization which maintains and fixes their whole construction machinery fleet also pile drivers. They operate piling in their own worksites but also, they buy pile driving contracting from other pile driver contractors and they do also contract work to other companies.

The need for service agreements depends on very much and in which section of operations customer needs assistance. The customer do not have a need assistance for preventative maintenance because they already have maintenance technicians on their own. The reason why they have chosen to invest into Lifecare+ service agreement was to get extended warranty to Junttan products. "It gave us extra safety for the lifetime of the machine, actually extended warranty was our idea to Junttan and the only reason why we were interested about service agreement".

We spoke about positives and negatives about Junttan service operations and service agreement. The customer has been happy about the expert level of Junttan technicians and how they operate in the worksite. "It is very good that they notice such a thing about the condition of the piling machinery which most of the people do not notice. We have also got some helpful tips of usability and maintenance of our machinery." Negative thoughts about Junttan were mostly about the quality of reports and consistency such as transparency of service agreement. "Sometimes we have got very good reports of audits and maintenance works which have been done. Sometimes they have been totally useless. Not enough information what is the condition of our piling machine or what have been done during the maintenance or the fixing of machinery". Good summary of their thoughts was that the operative part of Junttan service and service agreements is working quite well. Surely, they would want to have shorter lead time in case of their piling machinery needs fixing because schedules of piling job are very strict. Management and after-operations were the topics which got most of the negative feedback because customer got the feeling Junttan have avoided their responsibilities and Junttan do not focus on customer care other than the preventative maintenance part of the service agreement.

Lastly, we spoke about how they would improve Junttan service agreements if they could say what to do. "Focus on the customer care side on service offering, it is important for us customers that we get good quality service during the whole time period of service agreement. We would appreciate that there is primary contact person who could help us if we have questions and could take care of the responsibility of service agreement from Junttan side like delivering good reports and so on." Not all service agreements fit to every customer, and they admitted that current Junttan service agreement offering can not bring any extra value to their operations. "Junttan+ is unnecessary for us because we have the listing of our spare parts and also own personnel for preventative maintenance so Lifecare+ will be useless after we do not get extended warranty anymore." "On the other hand, some companies which do not have the same kind of resources which we have Junttan service agreements is a good choice"

10 RESULTS

It was possible to achieve a good overall picture about the current situation of service agreements even though the first impression was not a good one. Therefore, it was decided to focus on organizing processes in this thesis. It was thought that good thesis deliverables would be instructions, templates, and training material for internal Junttan corporation use. When Junttan starts to follow instructions and use provided material it is important that these are followed without hesitation. In the beginning when practices are implemented there should be zero excuses not to follow material because that creates the hassle if equivalent parties like subsidiaries make same operations differently. This does not mean that all the instruction nor material would be perfect from the beginning, but it is important to gain experience also bad experiences. If some instructed method or material does not work, then material should be updated because improvising is not an option. Junttan Oy has really important responsibility to follow service agreements status and discuss with subsidiaries also from bad experiences and offer as much training as possible. It will prevent all sort of improvising and makes managing agreement so much easier.

All Junttan subsidiaries were considered to be equivalent compared to each other because all the management and instructions are also equivalent to each other. *Example: Not all Junttan subsidiaries have their own Invoicing Department but those responsible for invoicing operations around services will take responsibility of service agreements invoicing.* This was also one reason why workload of service agreement was divided as much as possible. One focus point from the supervisor was that all the operations should be able proceed with the current number of employees. Dividing workload to right people was successful because departments which have already experience of running similar operations currently, they can easily take responsibility of tasks around service agreements.

11 CONCLUSION

11.1 Status now

Currently all the thesis material is being reviewed and examined can it be implemented fully or partially to Junttan practices. After Service agreements Department verifies that everything is good starts the internal training for Junttan Oy and its subsidiaries..

11.2 Future improvements

Thesis was just small portion of the development work for service agreements, and it is important to have constant development plan for service agreements. Same as all the other operations Junttan should have mindset that never be satisfied how current operations run because competitors also develop their offerings, and it is important not to fall behind. Improvement for service agreements can come from subsidiaries internally but Junttan should also listen carefully which kind of services customers want because in the end they are who are served with agreements.

Some service agreements have already been made but number of agreements is still relevantly small. Number of agreements should be increased somehow to all subsidiaries region because then running operations would become much smoother and experiences about operations would become to routine. Marketing service agreements is the key to attracting existing customers and new ones

to make service agreements. Junttan already have good service material for Junttancare and Lifecare agreements but not so many possible customers have seen them. Junttan Marketing Department makes big lines how service agreements should be marketed but marketing of service agreements is everybody's responsibility. *Example: Field service technicians meet customers daily and know customers service problems so it would be beneficial if even technicians could give service agreement brochures to customer in the exact moment and "offer" a solution for problems.* When agreements become more common to Junttan customers also the reputation starts to make marketing by itself. Junttan users compare themselves to each other and if one customer has gained phenomenal increase in productivity others want to increase their piling productivity as well and are more likely to make an agreement. Junttan customers also compete against each to get worksites, so they do not want to be left behind from development their business. Marketing strategies should be implemented to all Junttan subsidiaries because then all the marketing operations are equivalent to each other same as other operations. Basic marketing brochures are already made about individual service agreements, but next development step is to update service agreements material to most common languages. Some customers might be old fashioned, or they do not have so good English skill so making marketing material to different languages makes it more appealing to some customers. Second future improvement is to make printout notebook of service agreement which can be given in trade shows or when meeting customer.

During the thesis some internal material was created but in the future the material should be updated if there is relevant need for that. Well-functioning procedures should not be modified and also create new helpful material to support operations of service agreements. Now all internal material is available for Junttan Oy channels so it should be parse to SharePoint and Teams channels that everyone can easily check material. Service agreement options should also be updated to Junttan websites because it is relevant part of information to any customer. More templates should be created to different purposes like email template which are sent to customers about service agreement, visually appealing service kit part list-template to part deliveries with service agreements etc.

When procedures of service agreements have been agreed and ready to be implemented to Junttan use the most important part starts which is internal training. The thesis is internal instruction and teaching material for the Service Agreement Department, which is responsible to give all training to other departments. Service Agreement Internal Training (Appendix 8.) is the base for internal training, but more training material has to be created when problems are faced while running service agreements. Internal training is given to Junttan Oy first because they have to be prepared to answer questions which come up with from subsidiaries. Then it is time to give internal training to all subsidiaries at the same time because subsidiaries representatives will have similar questions and those questions can be answered at the same time. Internal training structure have to be build that in the beginning of the training basic concept of service agreement and its operations are given and from that on people from same departments are taught more specific tasks which are relevant for their operations.

The pricing of service agreements has to have some kind of structure in the future because now subsidiaries do not have easy answer to their local customer how much each service agreements

cost. Junttan should be prepared to create an Excel-calculator which would calculate rough cost and pricing for the service agreement based on piling machine model, manufacturing year, usage hours and distance to customer. This kind of calculator would make it much easier and smoother to make agreements and update pricing if there is increase for specific cost group.

Junttan is updating their ERP-system to newer version during 2023 and new ERP-version could offer much more opportunities and ease the follow up process. The current ERP-system which Junttan is running does not support easy agreement follow up and allocating costs and revenues from different operations to agreement itself is challenging. This is because different operations in ERP are managed by different service modules and parameters.

Another system update which might make running service operations easier is using Jira software. Jira is project management and tracking software by Atlassian. Jira could make it easier to follow up service agreements because it would eliminate use of share email box to service agreements. All IOT-tickets from services agreements would go automatically to Jira software and create step by step follow up project to contacting customer and making customer order.

12 FEEDBACK FROM JUNT TAN

"The thesis project was clear and easy to read. It was clear from the thesis what kind of organization we have and what is its history in the field of ground engineering. At the same time, the thesis showed the current state of the company's lifecycle services and their development needs. The thesis was done independently, and it turned out that the organization's situation has been studied thoroughly. The development ideas which emerged in the work are usable and they will be utilized in company business.

The student actively found out about the challenges of lifecycle services and brought up suggestions for improvement. While interviewing companies operating in the same field, the student identified good practices that the company could implement in the future to develop its own service offering and profitability." Manager of Service Agreements & Audits Sami Vartiainen, Junttan Oy.

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LIST OF APPENDICES

Appendices are confidential and shared only between author and client organization. Appendices are protected with Non-Disclosure Agreement (NDA).

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