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# SOLUTION APPROACH & ASSESSMENT: LITTLE STARS

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**Workshop:** Virtual, Friday, 06:00PM – 07:30PM

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## Executive Summary

This document details the analysis and evaluates the solution approaches for the fee payment, leave management, and inventory management process. A solution assessment was then conducted in order to evaluate and recommend the solution approach that will complement each process for Little Stars to implement.

The assessment and analysis of each process details the deliverables and components which are required for the implementation of the new system. Each process was thoroughly examined and given 3-5 different solution approaches. The method and development phases were determined for the delivery of each solution approach. Assessment of each solution approach was then judged by conducting a feasibility analysis of each approach. The operational, technical, schedule, and financial feasibilities of each approach was evaluated and compared by using a set of questions in order to determine which approach is the most viable for the process. The assessment of each feasibility was compared using techniques such as Forced Pair Analysis and Weighted Solution Comparison. In addition, the assumptions, and constraints for all suggested approach in a process were identified considering the technical, cost, risk, and viability issues. A solution approach was then chosen for their respective process based on the results of the feasibility analysis of each approach.

A comprehensive solution assessment was then conducted in which a recommendation of the final approach for the solution has been selected for implementation as Little Stars new system. The solution assessment defines the scope of the solution by detailing the new capabilities that the project will deliver. This will include the components and functionalities of the solution which will complement the business needs and requirements of Little Stars. The solution scope will also outline the capabilities supported by the new solution and the interim capabilities and necessary transitional capabilities are also outlined.

A business case has also been conducted as part of the solution assessment which will comprehensively assess the given tangible and intangible benefits, costs, and the risks associated with the chosen solution. The benefits have been further examined by conducting a benefits measurement in order to accurately get an unbiased understanding of how well the solution achieves the said benefits. Validation techniques such as focus groups, internal surveys, requirement walkthroughs, site metric collections, unit test, integration, system, and user testing has also been used. Additionally, a cost benefit analysis was conducted to determine the estimated associated costs and benefits for the project and to determine if it is feasible for a business standpoint. Comparison between costs and benefits will be conducted here, as such, if the benefits outweigh the costs, the project proceeds. Cost benefit analysis will encompass topics such as the payback period, return on investment, net present value, internal rate of return and risks.

Finally, allocation requirements which traces each component of the solution back through the given requirements based on the business goals and objectives of the project. Assessment of the organizational readiness for the implementation of the solution and all the required transitional requirements have been provided.

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# 1. Introduction

The report contains solutions approaches, ranking of those solutions and a final chosen solution that is assessed in its scope, business case, requirements, organizational readiness and states the transition requirements needed for the solution to be implemented. This document builds upon the previous business analysis document looking at the current problems and needs of Little Stars in its current position, and the requirements for a solution in the future. The prioritized solution requirements at all levels will be the main guiding document in the generation of solution approaches, as well as the stakeholder interviews that were conducted, with all further assumptions about stakeholders and Little Stars being listed after each segment due to the lack of explicit details surrounding Little Stars reaction to the previous document. This document has the intention of delivering the best value for Little Stars in its current circumstances, attempting to propose a realistic, high value solution that can match the future expansion of the business.

The estimated state of the current business is that due to the 1000 children costing parents \$120 per child per student per day (Care for Kids, 2022) which would be \$24,000 per child per a 250-day year. No more than \$30 million dollars of revenue is being generated each year and there are 300 staff across the entire organization. Each staff member on average will cost \$60,000 per year meaning there are \$18 million of staff costs per year (Darcy, 2019). The yearly cost of running a childcare centre excluding the labour cost is around \$38,000 per 4 students, and with 1000 students this is \$9 million dollars (Next Insurance, 2020). It is also assumed that Little Stars has mortgages on the land they are on as it is surrounding the inner suburbs of Brisbane which would be prohibitively expensive to buy outright. Assuming a lease cost of \$10,000 per week, per childcare centre, this would be 2.6 million in mortgage costs per year (Next Insurance, 2020). This only leaves a maximum of \$400k per year for all upgrades to any of the processes at Little Stars. Since there are currently 3 different processes that have been analysed in the prior report this leaves roughly \$133K funding per year. It is unknown whether Little Star has savings to spend on an upgrade, but the above numbers will be used as the rough approximation of solution financial boundaries. The structure of Little Stars is slightly ambiguous but gathered from the description its assumed that each branch has an office.

## 1.1. Business Needs

### Updated Business Needs

- Reduce the average wait time in payment line from 10 minutes to 1 minute within 6 months
- Reduce the time it takes for clerks to process a payment by 80% within 6 months
- Have a reduction of foot traffic at the payment counter down to at most 25 people per day within 6 months
- 95% reduction in paper form usage company-wide within 2 years
- 80% reduction in the turnaround time from form submission to approval within 6 months
- Increase the ratio of students to staff to 4:1 through the addition of new students to the centre within 5 years
- Produce a reports on demand instead of monthly within 1 year
- 80% reduction in time to fulfillment of stock requests within 1 year

## 2. Solution Approach

### 2.1 Fee Payment Solution (Declan)

#### 2.1.1 Proposed Solution

DID	DELIVERABLE	CID	COMPONENT
D1	Little Stars Fee Payment Website	C1	Database
		C2	Database Request API
		C3	Backup Systems
		C4	Product Analytics Page
		C5	Products Edit Page
		C6	Products Page
		C7	Fee Payment Page
		C8	Account Search Page
		C9	Account Creation & Login Page
D2	Hardware	C15	Code maintenance
		C10	Network
		C11	Computers
D3	Training	C12	Servers
		C13	Train Counter Staff to use system
D4	IT Support	C14	Provide Documentation for Parents
D5	Data Migration	C16	Internal and External requests/calls/emails
D6	Future Changes	C17	Receipt & Payment Forms Migration
		C18	Changes to the system to meet new demands

#### *Solution Description*

The fee payment solution is focused on developing a solution that fully encompasses all the functional and non-functional requirements set forth by stakeholders for the fee payment system by developing a website that is accessible both internally and externally. Externally so that the parents can directly pay tuition and product fees for their children and internally so that the counter staff can process product purchases and pay tuition fees at the counter for those who are unable or unwilling to use the new online fee payment website. The internal and external sides will be dictated by separation of privilege with parent, staff, board, and administrator accounts with separate functionalities. The website will need hardware in the form of servers to host the website and store database data, a network connection, and devices to connect the new servers and computers for the payment clerks to use the new website on. The payment clerks will also need to be trained to use the new system and documentation for parents needed for how they can use the system. IT support for the system will need to be provided that allow those who do not understand the system, are experiencing unknown errors or simply need help to receive assistance. Data migration will need to occur as the existing paper-based forms and existing receipts will need to be digitized and kept in the proper form on the database.

#### 2.1.2 Fully Integrated In-House Approach

The fully integrated in-house solution would have the solution be built by a new IT department at Little Stars consisting of an “IT Software Development” team and an “IT Support” team.

Deliverable	D1	D2	D3	D4	D5	D6
<b>Source:</b> <b>Little Stars</b>	IT Software Development	IT Software Development	IT Support	IT Support	IT Support	IT Software Development

### *Operational Feasibility*

The 'fully integrated in-house solution' would be able to meet nearly all of the business needs of Little Stars. Having an online fee payment system that is fully customized would allow for all of the deliverables to be produced to the exact functional and non-functional requirements. It would greatly reduce the wait time and foot traffic at payment lines in the office, reduce the time taken to process payments, especially with the integration of customized payment processing services into the website depending on parent requests. The website completely removes the need for paper forms for these processes meeting the 95% reduction. The staff to child ratio would unfortunately increase due to the need to form and hire an entirely new department for Little Stars.

The parents would be very receptive to the change in the organisation as the solution directly benefits them. Having additional features for parents to pay and purchase products will streamline their day to day lives and will have limited negative impact on them if they prefer the old system since counter staff will still be available to help. The IT support will be able to help both internally and externally providing great customer service. Staff will need to deal with the shift having needed to be retrained, questioned about detailed parts of the process so that the solution can be built as well as having new staff to deal with due to the new department. The solution would unfortunately be so efficient that the quantity of payment clerks or counter staff would be reduced. This could create some push back, but the needed requirements have already been gathered and thus the solution shouldn't be negatively impacted. However, the largest push-back will most likely be from the board due to the financial feasibility and schedule feasibility, since it will take a long time to implement and be quite expensive. Having everything custom built also means that the system does not have a lot of unnecessary features meaning that training for the new system should be easier as long as the user documentation provided by the developers is useful. The forms will also be quite similar to the existing paper ones and thus training for existing staff will be quite easy.

If the budget permits the organisation would be able to sustain the new 'Little Stars Fee Payment Website' as it is a permanent solution. This longevity is due to it being a fully customized solution with a new department will be able to be modified in the future to accompany significant changes at Little Star, as well as having all desired functional and non-functional requirements implemented. The only issue would be an expansion to meet any requirements that were not already included as they would need to be manually added afterward. Before the next decade the accompanying hardware will need to be upgraded as well as patches made for any security flaws that appear in underlying systems.

The non-functional requirements of the system will be able to be achieved but it is dependent on the quality of the hired development team. If the developers hired to be part of the new IT department are not up to standard, then the security and reliability of the project will be jeopardized. The in-house development team needs to perform unit testing and penetration testing to ensure security, as well as implement hashing, encryption, and separation of privileges. The implementation will also need to be internally audited to make sure it is working correctly and doesn't steal money from Little Stars or parents. Server uptime and response times are dependent on the quality of the code as well as the architecture that is chosen by the developers, but it will be easier to make sure this is implemented properly due to the department being so close to those who have the requirements and thus the board will have direct oversight on every aspect of the project.

### Technical Feasibility

<b>Deployment</b>	<ul style="list-style-type: none"><li>- <b>Web-based (Internal &amp; External Facing)</b></li><li>- <b>Database, Servers, Network</b></li><li>- <b>Windows (Desktop)</b></li></ul>
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The required technology does not currently exist at Little Stars. Little Stars has no IT department since all of the processes are handled using paper-based systems. It would be possible to have an IT department created and hired, with both IT support and software developers being brought on board to build and maintain such a solution but this will be a lengthy and expensive process. Without current knowledge of what IT skills are needed, a veteran IT manager will need to be hired to then set-up this new department. Once the majority of development is finished a significant portion of developers would need to be removed since the number of developers needed to produce the required results in the allotted time of 6 months to a year is very high. Otherwise, a sustainable number of developers are hired but the project is then a multi-year development which is unacceptable to the business sponsor. Once the IT department is working then Little Stars will have the technical expertise to install and operate the solution. The proposed changes are not easily compatible with existing infrastructure as the paper-based system will have to be completely reworked into a relational database via methods such as ORM and OCR. The user interfaces on the other hand will not change significantly from the forms that already exist. If more features need to be added to the website it will be quite expensive to add as all development is in-house, with changes during development resulting in delays and further costs, while post-implementation development will either need further hiring and costs or the implementation taking a long time with the permanent developers for the solution.

### Schedule Feasibility

The approach will be split into 4 Phases

#### Hiring and Department Setup (6 Months) (Reference)

- A new IT manager will be hired to lead the IT software development and support teams
- Hiring of software developers and support team members will occur
- On-boarding process will be developed so that new developers and support members will understand the requirements of the new system and their roles in the building and maintenance of the system

#### Development (1 year)

- This phase will consist of the IT software development team to work through the functional and non-functional requirements in the priority specified
- The server and network hardware will be set-up to host the website

#### Implementation Phase (4 months)

- The computers will be installed for the counter clerks by the IT Support team
- Data migration will need to occur of the existing paper-based records via semi-supervised OCR by the support team
- Training of existing and new staff will occur through the IT support team teaching the counter staff upon installation for an entire day

#### Post-Implementation: Ongoing

- Further strength testing and bug finding for the solution during off-peak periods such as after midnight should occur
- The IT departments support team will continue to provide IT support via requests, calls, and emails for the staff, board and parents
- The board will use the new analyst features to gain insight on the performance of the system



- The excess software developers will be fired with a few kept on to slowly implement new features and maintain the codebase

The phase timeline well exceeds the time constraints placed on the project during interviews with the solution only beginning to bring results at the 2-year mark. The organisations timetable is slightly unreasonable with the start of results wanting to be seen within 6 months. For the size of the project if enough capital and skilled manpower is thrown at the project then the timeline of 1 year of development is reasonable. However, the hiring and department setup stage could take significantly longer due to the current workplace conditions where hiring skilled IT workers is difficult due to the high demand. It could be that less skilled workers and less of them are available, and thus the solution delivery times are then blown out and the project is delivered well after expected dates.

### Financial Feasibility

#### Costs

Cost						
DID	Deliverable	Year 1	Year 2	Year 3	Year 4	Ongoing
D1	Little Stars System Website (Cost of Software Developer (Amount of Developers Needed Ref)	\$420,000.00	\$330,000.00	\$110,000.00	\$110,000.00	\$110,000.00
	90000					
	330000					
D2	Hardware	\$3,500.00	\$1,000.00	\$500.00	\$500.00	\$500.00
D3	Training	\$0.00	\$2,191.78	\$219.18	\$219.18	\$219.18
D4	IT Support (Cost of IT Support)	\$110,000.00	\$160,000.00	\$160,000.00	\$160,000.00	\$160,000.00
D5	Data Migration (Cost of IT Support)	\$0.00	\$35,068.49	\$0.00	\$0.00	\$0.00
D6	Future Changes (Other Costs)	\$0.00	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00
	<b>Total Yearly Costs</b>	<b>\$533,500.00</b>	<b>\$533,260.27</b>	<b>\$275,719.18</b>	<b>\$275,719.18</b>	<b>\$275,719.18</b>
					<b>Final Cost</b>	<b>\$1,893,917.81</b>

#### Benefits

Benefit	Estimated Yearly Value	Assumption
Increase in childcare scheduling	\$240,000.00	Equivalent of 2 days per student per year
Increased Product Purchases	\$50,000.00	\$50 per student of extra purchases
Debt Tracking collecting missing payments	\$24,000.00	1 child tuition per year
Better Management via Analytics	\$3000 (Compounding)	Improved Product Pushing
Fewer Parent Complaints leading to referrals	\$24,000.00	1 New Student a Year from word of mouth (Compounding Per Year)
Fewer fee payment forms for out of stock items	\$1,000.00	Amount lost via products not being able to be purchased
<b>Total Value</b>	<b>\$342,000.00</b>	<b>+/- 20% Estimate</b>
<b>Intangible Benefits</b>	<ul style="list-style-type: none"> <li>• Faster clerks look up times</li> <li>• Faster clerk payment processing</li> <li>• Improved parent happiness</li> </ul>	

The financial feasibility of the in-house solution is poor. As mentioned in the introduction the introduction the solution only has an absolute maximum of 400k if it's the only solution being implemented. The estimated cost is \$533k for the first two years and \$275k after that. This is a huge amount in comparison to the available funding and Little Stars will be unable to afford this even if the benefits outweighed the cost of the solution. The benefits to the solution do not exceed the cost for the first 2 years, after that the solution provides more benefits than it costs and would eventually meet a payback period of 7 years. This is a very long time and definitely too long for Little Stars to be happy as they will be unable to innovate and perform large projects till this one has been paid back.

*Assumptions & Constraints*

There are many assumptions that were made in this feasibility analysis. A lot of them surround the financial feasibility of the solution. The solution assumes the price values of most of the tangible benefits as they are not cost benefits but will still make a monetary impact on the company. It was assumed that parents would pay an extra \$50 product fees per year for their children based on the items that are in the form that Little Stars currently uses since there are quite a few books, supply, digital equipment, and uniform items. When it is easier to buy and pay for items that need to be used, parents will have the time and be able to buy them. Childcare scheduling is currently ridiculously difficult and time consuming for casual childcare drop-off, thus making it easier will definitely mean there will be an increase in children in the service. It is also assumed that at least 1 child's tuition payment goes missing each year due to clerical errors inherent in a paper-based system or is simply not paid and is missed in the audits.

*Summary*

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• Easier communication with developers</li> <li>• Improved control of product functionality hardware, development, support &amp; maintenance</li> <li>• Improve integration with other process upgrades</li> <li>• Known staff teaching other staff thus better compliance and culture</li> <li>• Customized solution limits extra non-sense that users have to avoid</li> <li>• Overall quality dictated by hiring choices which can lead to better quality</li> </ul>	<ul style="list-style-type: none"> <li>• Labour costs</li> <li>• Hardware costs</li> <li>• Hiring costs</li> <li>• Hiring and Setup Time</li> <li>• Maintenance Costs</li> <li>• Possibility hires lack skills</li> <li>• Internal culture might become slack</li> <li>• Long Payback Period</li> <li>• Does not meet business need time periods for value</li> <li>• Is not financially feasible</li> </ul>

### 2.1.3 COTS Approach

The COTS solution would have the solution be purchased from an existing provider and set-up by OWNA with direct conversation with BAs, board and payment clerks to hopefully complete most of the functionalities that are required by the stakeholders (OWNA, 2022). The commercial solution to be purchased is the OWNA system.

Deliverable	D1	D2	D3	D4	D5	D6
Source:	OWNA & Stakeholders	OWNA	OWNA	Internal OWNA External None	Payment Clerks	OWNA

#### *Operational Feasibility*

The 'COTS Solution' would be able to meet a majority of the business needs of Little Stars. The online fee payment system that OWNA provides is specifically built for the childcare education system. They offer payments, handle childcare subsidies and have payroll and billing. However, it is an all-in-one solution, so it also has programming and planning, education management, rostering and payroll, compliance and qualifications. This is much more than what was described in the deliverables, but thankfully they can be trimmed by OWNA to only include payment and billing. However, it does not meet all the requirements set out by the stakeholders such as product store that parents can purchase school supplies from nor does it have bookings for spontaneous child-care, but it does have a sign-in an sign-out system for hourly charging. It does have scheduling for daily childcare, repeat payments and invoices. It would greatly reduce the wait time and foot traffic at payment lines in the office but purchases of equipment would still need to be handle by counter staff. Not all payment processes would be able to be accepted, but standard credit card payments would be able to be used. The OWNA website would remove most of the need for paper forms for these processes except for handling direct purchases. The child to staff ratio would get better as there is no need to hire additional staff.

The parents would be somewhat receptive to the change in the organisation as the solution directly benefits them as having the ability to pay for childcare services and pre-organised products would be very handy to them. It may upset a few parents that purchases of items need to be handled through the old system and there are quite a few reviews trashing OWNA on its direct debit system as it is difficult for parents to stop direct debit once they are in the system. The interface will also be completely different to the existing one thus staff will need to be retrained, which is a service that OWNA provides. However, OWNA does have drag and drop documentations for parents on how to use their applications as each application is customized to the childcare centre. Parents may feel left in the dark due to the lack of website customer support and the big change in procedures, but the documentation should be some help. However, the old paper-based system will not be in use, parents will still have able to go to the payment clerks to deal with payments. However, with paper-based products purchases still needing to be handled with paper the wait times won't be completely removed. As the solution does not result with any firings or a reduction in job security the staff should be fully cooperative to the change once the website is fully released. The smallest push-back will be from the board as the solution is extremely cost-effective. The unnecessary extra features may feel cumbersome to many users.

Due to the large array of extra features the solution offers a lot of upsides with future moves towards the app's integration with existing processes. However, Little Stars will not be able to keep using OWNA if they are unable to provide a store like product system requiring a move to a different fee payment system provider. The OWNA team state they are committed to improving their application and their per-child per-month fee-based system means that the company needs to continuously improve or risk customers leaving as there is no large lock-in.

The non-functional requirements of the system are unfortunately completely out of the hands of Little Stars. Security with encryption, hashing and penetration testing will need to be taken on the word of OWNA as it is all completely behind the scenes on their end. Reliability is dependent on OWNA with mistakes made by OWNA developers affecting the company, but since they have an existing history of their application running relatively smoothly this is less risky than hiring developers. The solution will also need to be audited to make sure that OWNA is not taking a cut of revenue or stealing from Little Stars. The biggest risk is that OWNA makes large changes to UI and software via updates that completely confuse users or break integrations causing mayhem at Little Stars.

### Technical Feasibility

<b>Deployment</b>	<ul style="list-style-type: none"> <li>- <b>Web-based (Internal &amp; External Facing)</b></li> <li>- <b>App-Based (External Facing)</b></li> <li>- <b>Windows (Desktop)</b></li> </ul>
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The required technology currently exists as it is currently being used by many childcare centres all over Australia. The requirements have already been prioritized thus communications with OWNA over the small customization and desired features that are needed for the solution should not breakdown. The skills to use the new system will need to be taught by OWNA which is what they offer. Board members especially will need training as the 'analyst' side of their site is filled with information pertaining to the trends of parents and children. The proposed changes are not easily compatible with existing infrastructure as the paper-based records will need to be translated into the system, which is a service that OWNA does not offer. It is unknown whether the records are able to be translated and backdated but it is assumed that this is possible as there are examples of paper-based childcare centres upgrading to OWNA with ease. Little Stars does not have the technical know-how to install the solution, but OWNA promises also to provide this service as well.

### Schedule Feasibility

The approach will be split into 4 Phases

#### Product Negotiation (3 Weeks)

- Board & BAs will contact OWNA wanting a demonstration of OWNA applications functions and setup meetings
- OWNA will meet virtually with Little Stars board & BAs with the functional requirements listed and OWNA stating what they can and cannot customize as well as a time estimation on when the solution can be delivered

#### Implementation Phase (2 Weeks)

- OWNA returns with the customized fee payment system version of their off-the-shelf solution and any further modifications made
- OWNA sends technicians to each branch of Little Stars to install computers
- OWNA technicians train payment clerks once installation is complete

#### Post-Implementation: 4 months

- Data migration to the new system is performed by the payment clerks using OCR with scanners connected to the set-up computers
- Little Stars sends messaging to parents stating that new system online payment is available

The timeline meets the constraints of 6 months to see results as after 5 weeks OWNA promises to have the solution up and running for all childcare centres after contact. The organisations timetable is not unreasonable for a COTS solution. Very little manpower is needed for the project and apart from the implementation phase where there will be minor disruption for the clerks.

### Financial Feasibility

#### Costs

Cost						
DID	Deliverable	Year 1	Year 2	Year 3	Year 4	Ongoing
D1	Little Stars System Website	\$24,480.00	\$25,704.00	\$26,989.20	\$28,338.66	\$29,755.59
D2	Hardware	\$5,000.00	\$500.00	\$500.00	\$500.00	\$500.00
D3	Training	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
D4	IT Support	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
D5	Data Migration	\$35,068.49	\$0.00	\$0.00	\$0.00	\$0.00
D6	Future Changes (Other Costs)	\$0.00	\$250.00	\$250.00	\$250.00	\$250.00
	<b>Total Yearly Costs</b>	<b>\$64,548.49</b>	<b>\$26,454.00</b>	<b>\$27,739.20</b>	<b>\$29,088.66</b>	<b>\$30,505.59</b>
					<b>Final Cost</b>	<b>\$178,335.95</b>

## Benefits

Benefit	Estimated Yearly Value	Assumptions
Slight increase in spontaneous child drop-off	\$60,000.00	Equivalent of half days per student per year
Debt Tracking	\$24,000.00	1 child tuition per year
Better Management via Analytics means better product pushing	\$3000 (Compounding Per Year)	Large variety of information able to be given to management
Fewer Parent Complaints	\$12,000.00	1 New Student every 2 Year from word of mouth of new system
<b>Total Value</b>	<b>\$99,000.00</b>	<b>+ 20% Estimate</b>
<b>Intangible Benefits</b>	<ul style="list-style-type: none"> <li>• Faster clerks look up times</li> <li>• Faster clerk payment processing</li> <li>• Improved parent happiness</li> </ul>	

The financial feasibility of COTS solution is great with it costing well underneath the absolute maximum of \$400k. The estimated cost of \$66k and then slightly increasing yearly costs starting at \$26k. This is well underneath the price constraint estimated in the introduction and the benefits completely exceed the yearly cost. The value produced of \$97,000 year immediately pays back the solution cost due to the near instant implementation time.

### Assumptions & Constraints

There are fewer assumptions that were made in this feasibility analysis. Many of them surround the financial feasibility of the solution. The solution assumes the price values of most of the tangible benefits as they are not cost benefits but will still make a monetary impact on the company. When it is easier to pay for childcare when it is needed, then parents will drop-off their children more often. However, this won't be as often as if they could schedule this drop off because they will not have the guarantee that there are spots open to drop off a child. It is also assumed that at least 1 child's tuition payment goes missing each year due to clerical errors inherent in a paper-based system or is simply not paid and is missed in the audits. A lot of the OWNA solution features are hidden behind enquires which require that the childcare centre name be specified to have the full feature set of the software given. The comparisons to other childcare software providers that are linked at the bottom of their website are used to gather the set of features that are actually available. Ambiguous wording surrounding bookings and childcare time measurements means that it was an assumption that 'sign-in' & 'sign-out' meant signing in children to child-care and signing out in a drop-off system rather than the very basic interpretation that users are able to sign in and out of accounts.

### Summary

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• Financially viable (Great Benefit/Cost Ratio)</li> <li>• Cheaper development, maintenance &amp; support costs</li> <li>• Viable schedule (Very Quick to implement)</li> <li>• Technically viable (Existing solution)</li> <li>• Possible expansion &amp; integration into other processes</li> <li>• Experienced team already providing for reputable childcare centres meaning its stable</li> <li>• Support team has existing support experience</li> <li>• Regular upgrades</li> </ul>	<ul style="list-style-type: none"> <li>• Solution quality outside of influence of Little Stars</li> <li>• Slowly increasing cost</li> <li>• Increased staff retraining since bigger UI change</li> <li>• Does not meet business requirement for scheduling</li> <li>• Does not meet business requirement for product buying</li> <li>• Is missing other features that are 'must haves' to some stakeholders</li> <li>• Less market competitiveness due to other centres using the same software</li> </ul>

- |  |  |
|--|--|
|  | <ul style="list-style-type: none"><li>• No communication with developers only representatives</li><li>• Still need paper-based system for product purchases</li><li>• Secure data held outside of organisation</li></ul> |
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### 2.1.4 Outsourced Website Creation with Outsourced Support Approach

The outsourced website with outsourced IT support would have the website built by Kook, a website design, development and hosting firm, with a support team for the website provided by 'Influx' a customer support team provider. (Kook, 2022; influx, 2022).

Deliverable	D1	D2	D3	D4	D5	D6
Source	Kook	Kook & Little Stars	Kook	Influx	Influx	Kook

#### *Operational Feasibility*

The 'Outsourced Website Creation with Outsourced Support' would be able to meet all of the business needs of Little Stars. Having an online fee payment system that is fully customized would allow for all of the deliverables to be produced to the exact functional and non-functional requirements. It would greatly reduce the wait time and foot traffic at payment lines in the office, reduce the time taken to process payments, especially with the integration of customized payment processing services into the website depending on parent requests. The website completely removes the need for paper forms for these processes meeting the 95% reduction. The staff to child ratio would remain the same as all additional teams are not part of the organisation.

The parents would be very receptive to the change in the organisation at the solution directly benefits them. Having additional features for parents to pay and purchase products will streamline their day to day lives and will have limited negative impact on them if they prefer the old system since a counter staff member will still be available to help. The IT support will be able to help both internally and externally providing great customer service, with the outsourced support team being available 24/7. This means that after hour tickets, which is when 40% of tickets are produced, would be able to be answered providing very high quality of customer service to accompany the solution. Counter staff will need to deal with the shift having needed to be briefly retrained and questioned by the outsourced teams. The payment clerks would need to help train the Influx team and also support the Kook team with requirements. The solution would unfortunately be so efficient that the quantity of payment clerks or counter staff would be reduced. This could create the largest push back and negatively affect the solution with the payment clerks being non-complaint since its their jobs that are being threatened. There should be very little push-back from the board as the cost feasibility and schedule feasibility are decent. Having everything custom built also means that the system does not have a lot of unnecessary features meaning that training for the new system should be easier as long as the user documentation provided by the developers is useful. The forms will also be quite similar to the existing paper ones and thus training for existing staff will be quite easy.

If the budget permits the organisation would be able to sustain the new 'Little Stars Fee Payment Website' as it is a permanent solution. This longevity is due to it being a fully customized solution with Kook which offers a 'website upgrade' additional expenditure to update existing websites that it has built. Kook will be able have all the desired functional and non-functional requirements implemented as they have previously demonstrated stable and beautiful work on many websites. Kook also handles all the hardware at a flat rate so that the website will be able to adapt to any future hardware needs. The support provided handled through Influx will also be able to continuously provide customer support.

The non-functional requirements of the system will be able to be achieved but it is dependent on the quality of the Kook developers. Based on the performance of their previously implemented websites the non-functional requirements will definitely be met as the response times and security of these sites is state of the art. Kook has presented evidence of unit testing and penetration testing to ensure security, as well as having implemented hashing, encryption, and separation of privileges. The implementation will also need to be internally audited to make sure it is working correctly and doesn't steal money from Little Stars or parents. Server uptime and response times are dependent on the quality of the code as well as the architecture that is chosen by Kook. If Kook at some point decides that they are no longer going to update the server hardware while still keeping payments the non-functional requirements have the possibility of not being met, though Kooks customer support can be immediately contacted to have this remedied.



### Technical Feasibility

<b>Deployment</b>	<ul style="list-style-type: none"><li>- <b>Web-based (Internal &amp; External Facing)</b></li><li>- <b>Windows (Desktop)</b></li></ul>
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Little Stars does not currently have the ability to implement the solution, but Kook definitely does. They have been producing websites for clients for the last 10 years and while they have never done a childcare centre website, they have done both eCommerce with fee payment portals, as well as businesses websites. All of the processes are handled using paper-based systems currently, but Kook should be able to create the customized solution based off of the existing forms and the functional and non-functional requirements. The proposed changes are not easily compatible with existing infrastructure as the paper-based receipts need to be digitized so that existing outstanding payments can be handled through the new website. The implementation may be able to have OCR automatically performed as Kook are highly skilled developers with many websites and other solutions underneath their belt which means that Kook could perform the data migration in combination with payment clerks. This would also satisfy the CEOs desire to have 'automation' be in the solution. Post-implementation modifications can be performed by Kook but will be a large additional cost.

### Schedule Feasibility

The approach will be split into 4 Phases which is the plan stated by Kook.

#### Discover & Plan (2 Weeks)

- Business requirements discovery occurs between Kook and Little Star's board and BAs via virtual meetings
- Confirmation of the business requirements is established with contract signed so that work may begin

#### Onboarding & Initial Spec (3 Months)

- Meet with programming project manager to gather a full specification
- Designs, wireframes and a full set of costings is produced on top of the original estimate

#### Build & Beta Testing (1 Year)

- Minimum viable product built (3 months)
- Build the rest of the functionalities on (7 months)
- Beta-testing to makes sure there are no bugs (2 months)

#### Launch & Support (1 Month)

- Kook patches any bugs that may appear after the release
- Influx support team setup to handle new website functionalities
- Influx support team handle customer support 24/7
- Further development if needed
- Automated data migration using OCR

The 4 phases begin to bring value to the organisation on the 3 months mark due to Kooks ability to quickly construct an MVP while onboarding and initial specs are occurring due to their previous work which can be modified to fit new websites. The MVP could be released if needed as Kook does provide the option to launch in stages for cashflow or other reasons. The entire polished solution would be completed in just under a year and a half, which is well within the two-year mark set for a lot of the business needs. As the firm is completely separate it could be the case that they take on more work or less work during the time period that the Little Stars solution is being developed which could then mean that the phase time schedule either increases or decreases in length. This uncertainty would not affect Influx as influx has a very quick 1 week guarantee to have customer support staff trained to service Little Stars organisational needs.

### Financial Feasibility

#### Costs



Cost						
DID	Deliverable	Year 1	Year 2	Year 3	Year 4	Ongoing
D1	Little Stars System Website	\$35,000.00	\$3,500.00	\$0.00	\$0.00	\$0.00
D2	Hardware	\$0.00	\$5,000.00	\$500.00	\$500.00	\$500.00
D3	Training	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
D4	IT Support	\$0.00	\$100,728.00	\$100,728.00	\$100,728.00	\$100,728.00
D5	Data Migration	\$0.00	\$5,416.67	\$0.00	\$0.00	\$0.00
D6	Future Changes (Other Costs)	\$0.00	\$3,500.00	\$3,500.00	\$3,500.00	\$3,500.00
	<b>Total Yearly Costs</b>	<b>\$35,000.00</b>	<b>\$118,144.67</b>	<b>\$104,728.00</b>	<b>\$104,728.00</b>	<b>\$104,728.00</b>
					<b>Final Cost</b>	<b>\$467,328.67</b>

## Benefits

Benefit	Estimated Yearly Value	Assumptions
Increase in childcare scheduling	\$240,000.00	Equivalent of 2 days per student per year
Increased Product Purchases due to ease of purchase	\$50,000.00	\$50 per student of extra purchases
Debt Tracking of missing tuition	\$24,000.00	1 child tuition per year
Better Management via Analytics to push products	\$3000 (Compounding Per Year)	Improved Product Pushing
Fewer Parent Complaints leading to referrals	\$24,000.00	1 New Student a Year from word of mouth
Fewer fee payment forms for out of stock items which wont be fulfilled	\$21,000.00	That parents wont pay for items that aren't in stock, and this amounts to a yearly value
Removal of some payment clerks	\$325,000.00	Most parents migrating online means 1 payment clerk per location is not needed
<b>Total Value</b>	<b>\$687,000.00</b>	<b>+/- 20% Estimate</b>
<b>Intangible Benefits</b>	<ul style="list-style-type: none"> <li>• Faster clerks look up times</li> <li>• Faster clerk payment processing</li> <li>• Improved parent happiness</li> </ul>	

The financial feasibility of the outsourced solution is extremely reasonable. As mentioned in the introduction the introduction the solution has 133k year to work with and the project has at maximum \$69K of costs per year. The benefits of the solution exceed the initial cost of the solution due to the removal of payment clerks, but this is in the second year. The payback period is 2 years. This is a short enough time that Little Stars should be happy as they will be able to innovate and perform large projects soon after the new system is implemented.

### Assumptions & Constraints

There are many assumptions that were made in this feasibility analysis. The solution assumes the price values of most the tangible benefits. It is assumed that with easier use of the payment service that parents will end up purchasing more, and want to use the childcare drop-off as they can both schedule it or sure that there are slots. It was also assumed that with

the maintained or increased level of support from a 24/7 team of support representatives that it would increase the number of students due to parents sharing word of mouth about how the system has improved. The current wages of the payment clerks were assumed with the direct cost benefit being from the removal of one of the clerks from each branch's office. It is also assumed that at least 1 child's tuition payment goes missing each year due to clerical errors inherent in a paper-based system or is simply not paid and is missed in the audits.

*Summary*

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• Able to communicate with project manager developer</li> <li>• Medium control of product functionality development</li> <li>• Medium control of product support</li> <li>• Can expand into other process upgrades</li> <li>• Increased support availability time</li> <li>• Customized solution limits extra non-sense that users have to avoid</li> <li>• Reasonable time schedule that can meet business needs</li> <li>• Financially viable</li> <li>• High ROI</li> <li>• No hiring needed but still have high level of expertise</li> <li>• Hardware &amp; training done cost included by Kook</li> <li>• Data migration automation possible</li> </ul>	<ul style="list-style-type: none"> <li>• Further improvement to application starts development cycle over with additional costs</li> <li>• Possibility of miscommunication or being unable to finalise contract</li> <li>• Firing experienced payment clerks loses skills that new support crew need to still learn</li> <li>• Large pushback due to company firings and replacements</li> <li>• Quality of solution dependent on Kook</li> <li>• Delays in solution could occur due to unexpected occurrences at Kook</li> <li>• Server reliability dependent on Kooks continued prosperity</li> <li>• Secure data held outside of organisation</li> <li>• Lack of domain knowledge of childcare centres and their needs</li> </ul>

### 2.1.5 Outsourced Website Creation with In-House Support Approach

The 'Outsourced Website Creation with In-House Support' would have the website built by Strong, a website design, development and hosting firm, with an external support team formed out of the existing payment clerks (Strong, 2022).

Deliverable	D1	D2	D3	D4	D5	D6
Source	Strong	Strong	Strong	IT Payment Clerks	IT Payment Clerks	Strong

#### *Operational Feasibility*

The 'Outsourced Website Creation with In-House Support' would be able to meet all of the business needs of Little Stars. Having an online fee payment system that is fully customized would allow for all of the deliverables to be produced to the exact functional and non-functional requirements. It would greatly reduce the wait time and foot traffic at payment lines in the office, reduce the time taken to process payments, especially with the integration of customized payment processing services into the website depending on parent requests. The website completely removes the need for paper forms for these processes meeting the 95% reduction. The staff to child ratio would remain the same as all additional teams are not part of the organisation.

The parents would be very receptive to the change in the organisation at the solution directly benefits them. Having additional features for parents to pay and purchase products will streamline their day to day lives and will have limited negative impact on them if they prefer the old system since a counter staff member will still be available to help. The new system will also have the backing of the payment clerks which are familiar faces. Any bugs or errors with the website would still be directed to Strong, but the external and semi-internal facing IT payment clerks will be able to walk everyone through the new system once they have been taught by Strong. As a single payment clerk from each branch will be relocated to the main centre there will be 5 IT Payment Clerks on rotated shifts so that parents have support 24/7. This means that after hour tickets, which is when 40% of tickets are produced, would be able to be answered providing very high quality of customer service to accompany the solution, accompanied by a familiar voice. The big push back may be from the counter staff who are being relocated and reskilled, but this is better than them losing their jobs. It could be that some would quit due to the move with new staff needing to be trained by existing staff to fill in the gaps. There should be very little push-back from the board as the cost feasibility and schedule feasibility are decent. Having everything custom built also means that the system does not have a lot of unnecessary features meaning that training for the new system should be easier as long as the user documentation provided by the developers is useful. The forms will also be quite similar to the existing paper ones and thus training for existing staff will be quite easy.

If the budget permits the organisation would be able to sustain the new 'Little Stars Fee Payment Website' as it is a permanent solution. This longevity is due to it being a fully customized solution with Strong which offers a 'website upgrade' additional expenditure to update existing websites that it has built. Strong will be able have all the desired functional and non-functional requirements implemented as they have previously demonstrated stable and beautiful work on many websites. Strong also handles all the hardware at a flat rate so that the website will be able to adapt to any future hardware needs. The support provided to the parents and other staff handled by the re-trained payment clerks should be able to handle the scale of operations at Little Star.

The non-functional requirements of the system will be able to be achieved but it is dependent on the quality of the Strong developers. Based on the performance of their previously implemented websites the non-functional requirements should be met. The response times on a few of their websites were a little slow but this is due to the performance they offer being on a scaled monetary system, with more money buying more system resources to handle requests. Strong has presented evidence of unit testing and penetration testing to ensure security, as well as having implemented hashing, encryption, and separation of privileges. The implementation will also need to be internally audited to make sure it is working correctly and doesn't steal money from Little Stars or parents. Server uptime and response times are dependent on the quality of the code as well as the architecture that is chosen by Strong. If Strong at some point decides that they are no longer going to update the server hardware while still keeping payments the non-functional requirements may not be met.

### Technical Feasibility

<b>Deployment</b>	<ul style="list-style-type: none"><li>- <b>Web-based (Internal &amp; External Facing)</b></li><li>- <b>Windows (Desktop)</b></li></ul>
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Little Stars does not currently have the ability to implement the solution, but Strong definitely does. They have produced multiple websites for multiple companies, some of them which would be known to Little Stars such as Victoria Park. They offer in their 'Website Pro' bundle additional features such as advanced ECommerce (50 items), memberships and the ability to take online booking, all of which can be customized into the 'Little Stars Fee Payment Website' deliverable. They also offer hosting, launch support and website management at an additional monthly cost. All of the processes are handled using paper-based systems currently, but it does not appear that Strong has worked with OCR before and does not appear to make automated solutions. However, they promise to produce all content for website after having all documentation given to them so it may be the case that they do use OCR to help data migration. However, it is assumed that data migration is not the intended meaning of them saying that they create all content for the website but instead the web text and about pages, thus data migration will need to be done manually by IT Payment Clerks which will be a large task. Large modifications such as expanding to other processes will need further development, but minor modifications are completely covered with hosting and management.

### Schedule Feasibility

The approach will be split into 5 Phases which is the plan stated by Strong

#### Discover (2 Weeks)

- A thorough on-boarding process with Strong
- Little Stars board completes a questionnaire – telling Strong more about the business & Little Star's audience
- Video call between Little Star board, BAs and Strong to introduce the team & discuss questions

#### Define (1 Month)

- Little Stars and Strong work together to define the website goals which has already been achieved through the BA work
- Completion of a 'website strategic plan' that seeks to create a sitemap and low fidelity prototypes

#### Design (2 Months)

- Creation of website designs for key web pages by Strong
- Custom copy for the website written and implemented
- Revisions based on BA and board feedback

#### Deliver (3 months)

- Website implemented by Strong
- Website tested & full complaint to best practices and standards
- Website commissioned & launched
- Reskilling of the payment clerks by virtual guidance by Strong
- Installation of computers for existing payment clerks

#### Grow: Ongoing

- Continued support & hosting of website
- Changes made to match business growth
- Website kept secure
- IT payment clerks answer external and internal support tickets
- IT payment clerks perform data migration during off-peak times till backlog is finished

The 5 phases begin to bring value to the organisation on the 6 months mark due to Strong having existing templates that they then heavily modify to match the design that is wanted by client, allowing swift design and development, rather than from scratch codebases. This matches the desired initial value seen though the impacts will not be immediately seen and

will take time. Little Stars timeline is a bit unreasonable. Strong’s timeline is also a bit unrealistic as there will need to be a lot of edits and there are only 10 people total in their entire team. It will most likely take longer than their previous time schedules for websites and thus altered numbers are being used in the schedule. As the firm is completely separate it could be the case that they take on more work or less work during the time period that the Little Stars solution is being developed which could then mean that the phase time schedule either increases or decreases in length. This uncertainty shouldn’t effect the in-house support team as they will be retrained during delivery which is after the delays.

*Financial Feasibility*

**Costs**

Cost						
DID	Deliverable	Year 1	Year 2	Year 3	Year 4	Ongoing
D1	Little Stars System Website	\$30,000.00	\$0.00	\$0.00	\$0.00	\$0.00
D2	Hardware	\$1,000.00	\$2,499.00	\$2,499.00	\$2,499.00	\$2,499.00
D3	Training	\$5,416.67	\$1,354.17	\$1,354.17	\$1,354.17	\$1,354.17
D4	IT Support	\$0.00	\$16,489.00	\$16,489.00	\$16,489.00	\$16,489.00
D5	Data Migration	\$0.00	\$5,416.67	\$0.00	\$0.00	\$0.00
D6	Future Changes (Other Costs)	\$0.00	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00
	<b>Total Yearly Costs</b>	<b>\$36,416.67</b>	<b>\$28,758.83</b>	<b>\$23,342.17</b>	<b>\$23,342.17</b>	<b>\$23,342.17</b>
					<b>Final Cost</b>	<b>\$135,202.00</b>

**Benefits**

Benefit	Estimated Yearly Value	Assumptions
Increase in childcare scheduling	\$240,000.00	Equivalent of 1 days per student per year
Increased product purchases due to ease of purchase	\$50,000.00	\$50 per student of extra purchases
Debt Tracking able to gain missed payments	\$24,000.00	1 child tuition per year
Better Management via Analytics leading to better sales	\$3000 (Compounding Per Year)	Improved Product Pushing
Fewer Parent Complaints leading to referrals	\$24,000.00	1 New Student a Year from word of mouth
Fewer fee payment forms for out-of-stock items which won't be fulfilled	\$1,000.00	Amount of missed spending on out-of-stock items per year
<b>Total Value</b>	<b>\$342,000.00</b>	<b>+ 20% Estimate</b>
<b>Intangible</b>	<ul style="list-style-type: none"> <li>• Time savings for clerks and parents</li> <li>• Improved parent happiness</li> </ul>	

The financial feasibility of the outsourced solution is extremely reasonable. As mentioned in the introduction the introduction the solution has 133k year to work with and the project costs \$36k in the first year and \$23K of costs per year ongoing. The benefits of the solution exceed the initial cost of the solution since retraining staff if very cost effective as long as they do not quit due to the change in jobs. The payback period is 1 year. This is a short enough time that Little Stars should be happy as they will be able to innovate and perform large projects soon after the new system is implemented.

### Assumptions & Constraints

There are many assumptions that were made in this feasibility analysis. The solution assumes the price values of most the tangible benefits. It is assumed that with easier use of the payment service that parents will end up purchasing more and want to use the childcare drop-off as they can both schedule it and sure that there are slots. It was also assumed that with the maintained or increased level of support from a 24/7 team of support representatives that it would increase the number of students due to parents sharing word of mouth and the SEO google results about how the system has improved. It was also assumed in costs that the current staff would not leave and if a few did then the rehiring costs would be counted into the training as being a payment clerk does not require hiring skilled workers. It is also assumed that at least 1 child's tuition payment goes missing each year due to clerical errors inherent in a paper-based system or is simply not paid and is missed in the audits. Unfortunately, the time estimates are restrained since Strong do not have a 'time' line but do have different phases. Instead, the times are assumed based on the times of multiple other already completed projects which hint at the time they were started and ended in the case studies listed by Strong.

### Summary

Advantages	Disadvantages
<ul style="list-style-type: none"><li>• Able to communicate with best Strong package allowing unlimited calls</li><li>• Strong offers unlimited free edits meaning small changes will be able to be handled easily</li><li>• Copywriting and text of the site is written on behalf of Little Star</li><li>• SEO improves will allow more parents to find the childcare centre</li><li>• Medium control of product functionality development</li><li>• Medium control of product support</li><li>• Increased support availability time</li><li>• Customized solution limits extra non-sense that users have to avoid</li><li>• Reasonable time schedule that can meet business needs</li><li>• Financially viable with</li><li>• High ROI</li><li>• Transfer of expertise surrounding the process into the IT support meaning the best customer support</li></ul>	<ul style="list-style-type: none"><li>• Further large improvement to application starts development cycle over with additional costs</li><li>• Possibility of miscommunication or being unable to finalise contract</li><li>• Quality of solution dependent on Strong</li><li>• Delays in solution could occur due to unexpected occurrences at Strong</li><li>• Server reliability dependent on Strong's continued prosperity</li><li>• Secure data held outside of organisation</li><li>• Lack of domain knowledge of childcare centres and their needs</li><li>• Lack of expansion into other processes as it is outside the skills of Strong</li><li>• Lack of automated data migration means that IT payment clerks will need to spend time in periods of downtime</li><li>• Less cost benefits due to keeping of payment clerks</li></ul>

### 2.1.6 Buy Some Time Approach

The 'Buy Some Time Approach' would not have a website be built at all but instead have more payment clerks hired in each branches office so that a decision or solution in the future surrounding the fee payment system can be made while other more important processes are prioritized.

Deliverable	D1	D2	D3	D4	D5	D6
Source	None	Little Stars	Little Stars	None	None	None

#### Operational Feasibility

The 'Buy Some Time Approach' would not meet any of the business requirements other than immediately reducing the wait times but will not increase the speed of payment clerk fee processing nor reduce foot traffic and will have the amount of paper remain the same. The staff ratio would be negatively affected by the hiring of an additional two clerks per branch.

Parents would not notice a big difference other than thinking that the wait times have been slightly reduced. Parents would still complain about filling out long annoying forms. No analytics would be available to the board thus they wouldn't know about the efficiency gained or lost. Payment clerks would be happy to have more people working to reduce their workload but may be slightly annoyed to train new staff. The board would be annoyed unless other processes were able to be updated and produce more value than the possible value gains of the fee payment processing system.

Little Stars would not likely be able to sustain the 'Buy Some Time Approach' as it is not a permanent solution since it does not fix the underlying issue that is the paper-based process, instead band-aiding it by making it quicker for parents in the office.

The non-functional requirements will not be met as the new website will not be implemented.

#### Technical Feasibility

Deployment	- New Payment Clerks
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Little Stars does currently have the ability to implement the solution as it is simply hiring new staff which Little Stars would do on a regular basis due to people leaving or being fired for different reasons. Payment Clerks currently possess enough knowledge to train the new Payment Clerks about their tasks at Little Star.

#### Schedule Feasibility

The approach will be split into 3 Phases which is the plan stated by Strong

##### Hiring (1 Month)

- Advertisements for the job position with salary with be posted on job websites
- Resumes will be received and processed by a HR manager
- Interviews will be conducted, and appropriate recipients asked to join the company

##### Training (1 Month)

- New staff will have an existing payment clerk assigned to them for the training period so that the new staff can watch what the payment clerk does, and slowly be integrated into doing the work via handling the forms and participating in auditing

##### Grow: Ongoing

- New staff will continue to work as payment clerks at Little Star till another solution is decided

The time schedule would be feasible but again the solution does not meet the business needs. The business would feel a slight impact within 2 months but since the time constraints are for each of the business requirements, and these requirements would not be met other than wait times, which still would not be reduced as much as needed, the time restraints set do not matter.

Financial Feasibility

**Costs**

Cost						
DID	Deliverable	Year 1	Year 2	Year 3	Year 4	Ongoing
None	Hiring	\$1,000.00	\$0.00	\$0.00	\$0.00	\$0.00
D3	Training	\$5,416.67	\$1,354.17	\$1,354.17	\$1,354.17	\$1,354.17
None	Payment Clerk Support	\$650,000.00	\$650,000.00	\$650,000.00	\$650,000.00	\$650,000.00
		\$656,416.67	\$651,354.17	\$651,354.17	\$651,354.17	\$651,354.17
					Final Cost	\$3,261,833.33

**Benefits**

Benefit	Estimated Yearly Value	Assumptions
Fewer Parent Complaints Leading to Referrals	\$24,000.00	1 New Student a Year from word of mouth
<b>Total Value</b>	\$24,000.00	
<b>Intangible</b>	<ul style="list-style-type: none"> <li>Slight reduction in waiting times</li> <li>Improved staff moral</li> </ul>	

The financial feasibility of the ‘Buy Some Time Approach’ is quite atrocious as it exceeds the 133k designated to the solution, does not have tangible benefits (only an estimated tangible benefit based on an intangible benefit). It costs \$651 per year ongoing which is the new payment staff wages.

*Assumptions & Constraints*

There are not many assumptions other than that training and hiring will take a month since this is not explicitly stated and is completely assumed based on personal experiences with hiring and training. It is also assumed that the payment clerk efficiency is linear with an increase in staff meaning that the time in line will be reduced significantly.

*Summary*

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>Quick Solution</li> <li>Provides some result</li> <li>Little staff pushback</li> <li>No need for innovation as is an existing part of the business</li> </ul>	<ul style="list-style-type: none"> <li>Does not decrease paper usage</li> <li>Still will have lines of people waiting</li> <li>Parents will still complain about the forms</li> <li>Very expensive</li> <li>Will not allow parents to perform direct payment</li> <li>Will not allow for easy searching of records</li> <li>Will not allow for easy auditing</li> <li>Will not allow for scheduled recurring payments</li> <li>Will not allow for analytics of purchases</li> <li>Will not allow for parents to see casual childcare available slots</li> </ul>



## 2.1.7 Ranking Solution Approaches

### *Acceptance Criteria*

- A: The Little Stars Fee Payment Website must allow for the creation of parent accounts
- B: The Little Stars Fee Payment Website must allow for the payment of outstanding fees via an online portal accessible online
- C: The Little Stars Fee Payment Website must allow the purchasing of products
- D: The Little Stars Fee Payment Website should produce invoices for fee payments
- E: The Little Stars Fee Payment Website must allow for bookings to be made for the casual day care service via an online portal accessible online
- F: The Little Stars Fee Payment Website should allow for the changing of product costs
- G: The Little Stars Fee Payment Website could enable site usage information to be viewable
- H: The Little Stars Fee Payment Website could allow for integration with OCR or similar software to aid in data migration
- I: The Little Stars Fee Payment Website must meet corporation security standards such as SHA-256 encryption, HTTPS and hashing passwords
- J: The Little Stars Fee Payment Website must have a computer with website for each support technician or payment clerk
- K: The Little Stars Fee Payment Website must have a support team to contact for website queries or concerns

### *Evaluation Criteria*

- L: The Little Stars Fee Payment Website must take no longer than 2 seconds for any internal database call
- M: The Little Stars Fee Payment Website could take a maximum of 30 seconds to have payment confirmed once payment has been provided
- N: The Little Stars Fee Payment Website could refresh all current sessions with new price information within 30 seconds of an update being made
- O: The Little Stars Fee Payment Website must take no longer than 5 seconds to search for a parent account
- P: Little Stars Fee Payment Website could have support staff that are able to handle 2 external calls per hour
- Q: Little Stars Fee Payment Website could have support staff that are able to handle 1 internal email per hour

## Forced Pair Analysis

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
A		3	4	1	2	1	0	2	5	3	4	4	2	0	4	2	1
B	7		4	2	3	2	1	0	8	3	4	5	3	1	4	2	1
C	6	6		3	7	5	2	1	7	4	5	6	3	1	5	3	2
D	9	8	7		2	6	4	4	7	6	7	6	4	3	6	4	3
E	8	7	3	8		2	1	3	5	4	4	4	2	6	6	3	2
F	9	8	5	4	8		5	6	9	6	4	5	3	4	1	2	2
G	10	9	8	6	9	5		6	8	8	8	8	6	3	8	8	7
H	8	10	9	6	7	4	4		10	10	9	5	4	3	8	6	5
I	5	2	3	3	5	1	2	0		2	2	4	2	1	2	2	1
J	7	7	6	4	6	4	2	0	8		3	6	2	1	6	3	2
K	6	6	5	3	6	6	2	1	8	7		8	2	1	6	2	1
L	6	5	4	4	6	5	2	5	6	4	2		3	2	4	2	1
M	8	7	7	6	8	7	4	6	8	8	8	7		5	8	5	4
N	10	9	9	7	4	6	7	7	9	9	9	8	5		8	7	6
O	6	6	5	4	4	9	2	2	8	4	4	6	2	2		1	0
P	8	8	7	6	7	8	2	4	8	7	8	8	5	3	9		3
Q	9	9	8	7	8	8	3	5	9	8	9	9	6	4	10	7	
Total	122	110	94	74	92	79	43	52	123	93	90	99	54	40	95	59	41

- Must was assumed to be 95 or above
- Should was assumed to be between 90-60
- Could was assumed to be 59 or below

The evaluation and acceptance criteria wording were changed from Part 1 to match the Forced Pair Analysis.

### Assumption & Constraints

The weights in terms of absolute need are assumed from the forced pair analysis that was performed. The in-house solution as previously discussed is assumed. The feature sets above should be fully representative of the acceptance and evaluation criteria. Further depth could be gone into by using the functionalities in part 1, but as 28 were listed it would make this task too unwieldy, thus elements like 'payment types' were included under 'payment of outstanding fees by portal'. The weights applied to the final weighted comparison are filtered through what each solution is actually able to provide, either yes (1), no (0) or partial with partial assumptions being listed below. Most solution fulfillments need to be estimated from the limited information that solution providers provide.

**A1:** The COTS OWNA system is only partially able to provide the casual drop off system as it is unable to show many children are currently in it nor make spontaneous bookings but can charge on an hourly basis for the childcare.

**A2:** The in-house system could build OCR automation integration but due to the already extended implementation time and that being a very different and difficult skill set it is unlikely the developers hired would have those skills. The Out/In mix while not being able to create an automated data migration system will still have the existing payment clerks who are well versed in this forms and will be reskilled to be the IT support and thus are in a very good position to be able to efficiently do data migration.

**A3:** The outsourced and COTS claim to have the security features implemented but this cannot be entirely verified thus 0.8 is given. All of these also suffer that sensitive information is being held by those outside of Little Stars

**A4:** The COTS only has internal facing support with parent support not being available other than through limited documentation. The first outsourcing via Influx may suffer from issues surrounding the quality of the support provided due to cultural or language barriers due to outsourcing of support members.

**A5:** The outsourced and COTS options are unable to have price edits performed within 30 seconds due to the contact times to make edits to the sites as well as servers being remote thus the information needing to go through the providers, update the hosting which is sometimes not even stored with the provided but outsourced again to AWS and then have that push to all current users.

**A6:** Parent account searching does not appear to be a feature available for the OWNA system but it does have parent accounts in general. Without seeing the backend this is only an assumption and may be an unlockable feature that isn't described.

Constraints as stated in the introduction from a brief current financial position estimate of Little Stars is that 133k is dedicated to the project per year, and a maximum of 400k per year if going over budget or scarifying other process upgrades. The business needs have time constraints with no longer than 2 years to have benefits shown, 1 year preferred for implementation and 6 months desired from some optimistic board members.

*Weighted Comparison*

+1 point was given for every month before expected realistic time of a year and -1 for every month afterward. +1 point was given for every 20k under budget and -1 point for ever 20k over budget for the total cost over a period of 5 years, with the price set to beat being \$133k times 5 (\$665k)

Weight calculations with solution features

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	Total
Weights:	4.9	4.4	4	3	3.68	3.2	1.7	2.1	4.9	4	4	4	2	2	4	2	2	54.4
In-House	1	1	1	1	1	1	1	0.5	1	1	1	1	1	1	1	1	1	53.36
COTS	1	1	0	1	0.5	0	1	0	0.8	1	0	1	0	0	0	0	0	28.136
Outsource	1	1	1	1	1	1	1	1	0.8	1	1	1	1	0	1	1	1	51.096
Out/In Mix	1	1	1	1	1	1	1	0.5	0.8	1	1	1	1	0	1	1	1	50.776
Buy Time	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2.96

Weighted Solution Comparison

Solution	Score	Cost	Months	Over/Under Budget	Budget	Implementation Time	Total (Score/Budget/Imp)
In-House	53.36	\$1,893,917.81	24.00	-\$1,228,917.81	-61.4459	-12.00	-20.08589041
COTS	28.136	\$178,335.95	1.25	\$486,664.05	24.3332	10.75	63.21920269
Outsource	51.096	\$467,328.67	15.00	\$197,671.33	9.883567	-3.00	57.97956667
Mix	50.776	\$135,202.00	7.00	\$529,798.00	26.4899	5.00	82.2659
Buy Time	2.96	\$3,261,833.33	2.00	-\$2,596,833.33	-129.842	10.00	-116.8816667

2.1.8 Summary:

From this it is demonstrated that the best solution for the new fee payment system which is the 'Little Stars Fee Payment Website' is the outsourcing/in-house mix as it provides the best combination of value, time and fulfills most to all of the business needs, keeping in mind the heavy amount of assumptions that need to be true due to the lack of information regarding Little Stars business. A lot of the benefits are weak estimates thus the benefits were not included in the weighted comparison, only the costs since cost estimates come from solid sources and can be demonstrated from other projects. As the mix one with such a large margin over the other options, no further deliberation was needed on which out of the solutions would be chosen.

## 2.2 Leave Management Solution (Jason)

The leave management solution focuses on determining an appropriate solution that resolves most if not all problems that have been identified within the current leave management process. Whilst also achieving the goals and objectives of Little Stars.

Propose Solution Deliverables and Components:

DID	DELIVERABLE	CID	COMPONENT
D1	Little Stars Leave Management Website	C1	Database
		C2	Database Request API
		C3	Backup Systems
		C4	Account Creation
		C5	Account Management
		C6	User Administration
		C7	Leave Management
		C8	Leave Approval
		C9	Leave Notifications
		C15	Code maintenance
D2	Hardware	C10	Network
		C11	Computers
		C12	Servers
D3	Training	C13	Training of HR, Staff and Managers
		C14	Documentation and Guides
D4	IT Support	C16	Internal requests/calls/emails
D5	Data Migration	C17	Leave and Leave Balance Migration
D6	Future Changes	C18	Changes to the system to meet new demands

The Business Analyst team has developed the solution deliverables and components from the functional and non-functional requirements that were outlined by the key stakeholders for the Leave Management System. The deliverables have then been used to determine four solution options for the leave management system. Finally, the four solution options have been ranked to choose the most appropriate solution for Little Stars.

### 2.2.1 Fully Integrated In-House Approach

A fully integrated in-house solution will be designed, developed, and maintained by a newly formed IT department. This allows Little Stars to have full control and ownership over the solution approach. With this approach all functional and non-functional requirements can be implemented. It is also possible to implement additional requirements, if necessary, however, this is discouraged during development due to it impacting the budget and timeline of the project. Once implemented Little Stars can expand and enhance the leave management system to add in additional features and functionality if required.

Picking a fully integrated in-house approach allows Little Stars full control over all aspects of the implementation. It also means Little Stars is fully responsible for the up-keep and maintenance of the leave management system requiring Little Stars to retain an IT department.

The fully integrated in-house approach will be comprised of five phases:

#### **Hiring and Department Setup Phase (3 months)**

- IT management, software developers, specialised contractors and testers will be hired to work with the existing IT team
- Processes to be developed to on-board new team members to understand the current and future state requirements.

#### **Proof of Concept and Design Phase (3 months)**

- The newly formed IT department will develop of several proof-of-concept designs to determine the best possible implementation approach

**Development Phase (18 months)**

- The IT department will iteratively work complete the functional and non-functional requirements based on the given priorities
- Test and improve implemented requirements

**Implementation Phase (3 months)**

- Data migration of all pre-existing leave and leave balances
- Training of staff will be required to make sure that they are familiar and able to use the leave management system

**Post Implementation Phase (Ongoing)**

- The IT department will monitor the newly deployed product and resolve any unexpected issues that arise
- The IT department will be aiding staff members through requests, calls and emails

The table below provides a summary of the advantages and disadvantages of implementing a fully integrated in-house solution approach.

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• High level of control over implementation and design</li> <li>• Features can be added and descoped during development</li> <li>• User feedback can be implemented during the development period</li> </ul>	<ul style="list-style-type: none"> <li>• Hired IT staff may need to be let go post implementation</li> <li>• Specialised Contractors may need to be used which is expensive</li> <li>• Current IT staff may not be capable of developing software</li> <li>• IT staff will need to be kept for system maintenance and defect resolution</li> <li>• Development timeframes may be missed</li> <li>• Implementation may need to be audited by legislators</li> </ul>

### 2.2.2 COTS Approach

A COTS product allows Little Stars significant opportunities to customise the behaviour, implementation, and functionality of the system at additional cost. This is an advantage over other approaches as it is customisation to a pre-existing system rather than building a new system from the ground-up. This reduces financial risks and allows Little Stars to allocate resources to other aspects of the company and reduces the need to hire additional ongoing IT support.

MYOB is traditionally an accounting and payroll company. However, they also provide a workforce management feature (Workforce management software, 2022). MYOB provides a cloud-based ERP system (ERP Software, 2022) where the price varies based on the customization required to use the product.

A downside of a COTS solution is integrating it with other solutions and systems. Often having proprietary API's and interfaces. As Little Stars has no pre-existing systems which require integration for leave management this is a non-issue.

The COTS approach will be comprised of four phases:

#### **Product Negotiation (1 month)**

- The Business Analyst team will consult with MYOB to discuss the feasibility and if the product covers the key functional requirements
- The product will be demonstration to the Board

#### **Product Customisation (3 month)**

- Working with MYOB to customise the ERP product to make sure that it is fit for purpose

#### **Implementation Phase (1 month)**

- Engage with a MYOB consultant to receive guidance on the best way to implement the product(s) into Little Stars
- User Account Registration
- Data Migration of existing Leave Requests and Balances into the new system
- Create Training Documentation

#### **Post Implementation Phase (Ongoing)**

- Staff Training on the new product
- Customer support through chat, emails, and calls to MYOB

The table below provides a quick summary of the advantages and disadvantages of implementing a COTS solution approach.

Advantages	Disadvantages
<ul style="list-style-type: none"><li>• MYOB has other products that can cover other facets of Little Stars business such as accounting and payroll</li><li>• Relative Cheap ongoing expenses</li></ul>	<ul style="list-style-type: none"><li>• Little Stars does not have full control</li><li>• Unlikely to meet all the business requirements</li><li>• Workforce management is not the core business product of MYOB</li></ul>

### 2.2.3 Outsourcing Approach

An Outsourcing approach that the Business Analyst team decided on would be engaging WorkingMouse to develop a custom Leave Management System. WorkingMouse is an Australian software development company that excels at designing and developing software solutions (WorkingMouse, 2022). WorkingMouse is a Brisbane based company founded in 2013. They have been chosen for the outsourcing approach based on their past projects and industries that they have worked with.

By implement an Outsourcing approach, the solution that will be developed by WorkingMouse will be unique to Little Stars and cover all the functional and non-functional requirements. This approach is better compared to the “Fully Integrated In House Approach” as additional staff will not need to be hired and an on-site IT team will not be required. It is also a better approach compared to the “COTS Approach” as the product will be designed for the requirements. Post Implementation assistance and support can be obtained from WorkingMouse. WorkingMouse can also enhance the product in the future if required.

WorkingMouse’s 9 years of experience and expertise within the software development industry has allowed them to be transparent in the costs associated with software development (Costs You Need to Know, 2022). They are also transparent in the software technologies and frameworks that they use to develop their solutions.

The Outsourcing approach will be comprised of four phases:

#### **Consultation and Planning (3 months)**

- The Business Analyst team will consult with WorkingMouse to discuss and define the Leave Management System based on the functional and non-functional requirements
- WorkingMouse to prepare a plan for the development of the new Leave Management System
- WorkingMouse to choose the best-fitting technologies and frameworks for the system
- WorkingMouse will design a secure software framework and provide UX wireframes

#### **Development Phase (1 year)**

- The WorkingMouse Development team will work through to complete the functional and non-functional requirements based on the requirements for the new Leave Management System
- WorkingMouse to perform testing and showcases to Little Stars

#### **Implementation Phase (1 month)**

- User Account Registration
- Data Migration of existing Leave Requests and Balances into the new system
- Create Training Documentation

#### **Post Implementation (Ongoing)**

- Staff Training on the new product
- Customer support through chat, emails, and calls to WorkingMouse where required

The table below provides a quick summary of the advantages and disadvantages of implementing a Outsource solution approach.

Advantages	Disadvantages
<ul style="list-style-type: none"><li>• The solution will cater to the given requirements</li><li>• Reduces the hiring overhead freeing up internal resources</li></ul>	<ul style="list-style-type: none"><li>• Negotiations may be time consuming</li><li>• Changes may be expensive if missed requirements are discovered late in the development phase</li><li>• Changes or additions post implementation may be difficult if performed by another team</li></ul>

## 2.2.4 SaaS Approach

An SaaS approach that the Business Analyst team decided on would be engaging with Bamboo HR to use their online HR system. Bamboo HR is an American technology company that excels provides HR solutions (BambooHR, 2022). A SaaS solution, as opposed to the other approaches is a cloud-based Human Resource system. This means that it can be accessed anywhere by any user given they have internet access.

The SaaS approach will be comprised of three phases:

### **Product Negotiation (1 month)**

- The Business Analyst team will consult with BambooHR to discuss the feasibility and if the product covers the key functional requirements
- The product will be demonstration to the Board

### **Implementation Phase (1 month)**

- Engage with a Bamboo HR consultant to receive guidance on the best way to implement the product(s) into Little Stars
- User Account Registration
- Data Migration of existing Leave Requests and Balances into the new system
- Create Training Documentation

### **Post Implementation Phase (Ongoing)**

- Staff Training on the new product
- Customer support through chat, emails, and calls to Bamboo HR where required

The table below provides a quick summary of the advantages and disadvantages of implementing SaaS solution approach.

Advantages	Disadvantages
<ul style="list-style-type: none"><li>• Short implementation and integration period</li></ul>	<ul style="list-style-type: none"><li>• Costly</li><li>• Fully Reliant on Bamboo HR</li><li>• Unlikely to meet all the business requirements</li></ul>



### 2.2.5 Feasibility Analysis

Conducting a feasibility analysis helps determine that the project to determine a new Leave Management System is viable. This section will analyse the Operational, Technical, Schedule, and financial feasibility of the project. This feasibility analysis is important as it will assess the four provided solution options that the Business Analyst team has provided and decided on the most correct approach.

The Business Analyst team has used Forced Pair Analysis to conduct the feasibility analysis for the Operational and Technical feasibility. Forced Pair Analysis has been utilized as it is an effective way of comparing a options where it is difficult to determine what the best option is. This makes it easy to rank the solution options to determine which one is the most appropriate.

#### *Operational Feasibility*

The following questions were used by the Business Analyst team as a guide in order to rank the four approaches in the Forced Pair Analysis Matrix for Operational Feasibility.

1. How well are the business needs met by each solution approach?
2. How receptive is Little Stars to change from their current Leave Management System to the given solution approaches by the Business Analyst team?
3. How well can the solution approach be sustained?
4. How well are the non-functional requirements met by the suggested solution approach?

#### **Forced Pair Analysis Matrix for Operational Feasibility:**

	<b>A: In-House Solution</b>	<b>B: COTS Solution</b>	<b>C: Outsourcing Solution</b>	<b>D: SaaS Solution</b>
<b>A: In-House Solution</b>		A, 2	C, 1	D, 2
<b>B: COTS Solution</b>			C, 2	D, 2
<b>C: Outsourcing Solution</b>				D, 1
<b>D: SaaS Solution</b>				
<b>TOTAL</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>5</b>

**Legend:** 0 (No Difference Found), 1 (Slightly More Importance), 2 (major difference, much more importance found than the other)

From the Forced Pair Analysis, it is evident the “SaaS Approach” is the most operationally feasible. The SaaS Approach (Option D) was able to meet the four guideline questions used to determine the importance of each solution.

### Technical Feasibility

The following questions were used by the Business Analyst team as a guide in order to rank the four approaches in the Forced Pair Analysis Matrix for Technical Feasibility.

1. Does the required skills and technology exist within Little Stars for the solution approach?
  - a. If not, can it be acquired?
2. Are the changes that will be proposed compatible with the current infrastructure of Little Stars?
3. Is Little Stars capable and has the technical expertise to install and operate the solution approach?

#### Forced Pair Analysis Matrix for Technical Feasibility:

	A: In-House Solution	B: COTS Solution	C: Outsourcing Solution	D: SaaS Solution
A: In-House Solution		B, 1	C, 1	D, 2
B: COTS Solution			C, 2	D, 2
C: Outsourcing Solution				D, 1
D: SaaS Solution				
TOTAL	0	1	3	5

**Legend:** 0 (No Difference Found), 1 (Slightly More Importance), 2 (major difference, much more importance found than the other)

From the Forced Pair Analysis, it is evident the “SaaS Approach” (Option D) is the most technically feasible.

### Schedule Feasibility

The following questions were used by the Business Analyst team as a guide to determine which of the four approaches are feasible based on the schedule.

Questions:

1. Can the solution approach be delivered within the given time constraints for the project?
2. How reasonable is the time frame that Little Stars has provided in order to complete the project?
3. How reasonable is the time frame that is provided by the solution approach?
4. Can the development of the solution approach be delivered in stages?

	A: In-House Solution	B: COTS Solution	C: Outsourcing Solution	D: SaaS Solution
Question 1	No	Yes	No	Yes
Question 2	Fair	Fair	Fair	Fair
Question 3	Not Fair	Fair	Not Fair	Fair
Question 4	Yes	Yes	Yes	No

	Costs	Benefits
<b>A: In-House Solution</b>	<b>Software:</b> \$10,000 <b>Hardware:</b> \$10,000 <b>Hiring:</b> \$250,000 <b>Training:</b> \$5,000 <b>Total:</b> <b>\$275,000</b>	<b>Tangible Benefits:</b> <ul style="list-style-type: none"> <li>• Customised Implementation</li> <li>• Improved Data Quality and Accessibility</li> </ul> <b>Intangible Benefits:</b> <ul style="list-style-type: none"> <li>• Increased Efficiency</li> <li>• Improved user experience</li> </ul>
<b>B: COTS Solution</b>	<b>Software:</b> \$499 per month <b>One Time Charge for ERP customisation:</b> \$10,000 <b>Hardware:</b> n/a - Existing Hardware is sufficient <b>Training:</b> \$5000 <b>Total:</b> <b>\$15,000</b> <b>\$499 Monthly</b>	<b>Tangible Benefits:</b> <ul style="list-style-type: none"> <li>• Cost and Time Savings</li> <li>• No Hardware required</li> </ul> <b>Intangible Benefits:</b> <ul style="list-style-type: none"> <li>• Training</li> <li>• Improved user experience</li> </ul>
<b>C: Outsourcing Solution</b>	<b>Software:</b> \$150,000 <b>Hardware:</b> \$2,500 <b>Training:</b> \$5,000 <b>Total:</b> <b>\$157,500</b>	<b>Tangible Benefits:</b> <ul style="list-style-type: none"> <li>• Customised Implementation</li> <li>• Improved Data Quality and Accessibility</li> <li>• Reduced Hiring Overhead</li> </ul> <b>Intangible Benefits:</b> <ul style="list-style-type: none"> <li>• Increased Efficiency</li> <li>• Improved user experience</li> </ul>
<b>D: SaaS Solution</b>	<b>Ongoing monthly cost:</b> \$20 per user * 50 users = \$1000 per month <b>Hardware:</b> n/a - Existing Hardware is sufficient <b>Training:</b> \$5000 <b>Total:</b> <b>\$1000 Monthly</b>	<b>Tangible Benefits:</b> <ul style="list-style-type: none"> <li>• Offers 30-day free trial</li> <li>• Cost and Time Savings</li> <li>• Hardware cost savings</li> </ul> <b>Intangible Benefits:</b> <ul style="list-style-type: none"> <li>• Training</li> <li>• Improved user experience</li> </ul>

*Feasibility Analysis Conclusion*

After analysing and comparing each solution approach, it has been decided that option D the “SaaS Approach” is the most suitable. It meets the operational, technical, schedule and financial feasibility criteria.

## 2.2.6 Ranking Solution Approach

### Acceptance Criteria

- A. The new leave management system must allow users to maintain their login credentials
- B. The new leave management system must login a user if their login credentials are correct
- C. The new leave management system must allow for the creation of a leave request
- D. The new leave management system must allow updates to be made to unapproved leave requests
- E. The new leave management should allow an unapproved leave request to be cancelled
- F. The new leave management system must assign a leave request to the teaching staff's supervisor once submitted
- G. The new leave management system must allow a pending leave request to be approved or rejected.

### Evaluation Criteria

- H. The new Leave Management system must not allow teaching staff to approve their own leave requests
- I. The new Leave Management system must take no longer than 15 seconds to perform any action

### Weighted Solution Comparison

The Business Analyst team has given each acceptance and evaluation criteria a letter respectively. Additionally, the team has allocated a weight to each one based on their importance with a scale from 1-10, 1 being least important, 10 being the most important. These were then used to perform the weighted comparison for each solution approach.

	A	B	C	D	E	F	G	H	I	TOTAL
<b>WEIGHT</b>	5	8	9	5	2	9	9	9	7	
<b>In-House</b>	Y	Y	Y	Y	Y	Y	Y	Y	Y	63
<b>COTS</b>		Y	Y	Y	Y	P	Y	Y	Y	53.5
<b>Outsource</b>	Y	Y	Y	Y	Y	Y	Y	Y	Y	63
<b>SaaS</b>	P	Y	Y	P	Y	Y	Y	Y	Y	58

#### Legend:

"Y" will receive full weight marks as it meets the full criteria

"P" will receive half weight marks as it partially meets the criteria

Solution	Score	Cost	Months	Over/Under Budget	Budget	Implementation on Time	Total (Score+Budget+Imp Time)
<b>In-House</b>	63	\$275,000	27	\$25,000	1.25	-9	55.25
<b>COTS</b>	53.5	\$44,940	5	\$205,060	10.25	13	76.75
<b>Outsource</b>	63	\$157,500	16	\$92,500	4.65	2	69.65
<b>SaaS</b>	58	\$65,000	2	\$185,000	9.25	16	83.25

**Note:** The costs for the COTS and SaaS approaches are for a 5-year period. \*Not including price changes

### Assumptions & Constraints

- Budget would be \$250,000
- Delivery Period would be 18 months
- Cost figures are only upfront costs, running costs such as ongoing maintenance costs have not been considered
  - Except for the COTS and SaaS 5-year period costs.

### Ranking Solution Approach Conclusion

The SaaS solution approach has been chosen by the Business Analyst team as the suggested approach for the new Leave Management System. The SaaS ranked the highest after conducting a weighted solution comparing it also meets the operational, technical, schedule and financial feasibility criteria.

## 2.3 Inventory Management Solution (Jericho)

In order to solve and clear up the identified problems within the current Inventory Management Process of Little Stars and to simultaneously achieve Little Stars goals and objectives, the Business Analyst team has developed a recommendation for a new Inventory Management System which will mitigate and solve the current process problems. Below are the following Proposed Solution Deliverables and Components:

DID	DELIVERABLE	CID	COMPONENT
D1	Little Stars Inventory Management Software	C1	Database
		C2	Backup Systems
		C3	Barcode Scanning System
		C4	Real Time Inventory Updating System
		C5	Purchase Order Management
		C6	Inventory Analytics and Reports
		C7	Warehouse Stock Management
		C8	Order Management
		C9	Purchase Management
D2	Hardware	C10	Network
		C11	Computers
		C12	Servers
D3	Training	C13	Training of Staff, Purchasing Officer, Operations Manager
		C14	Documentation
D4	IT Support	C15	Internal and External requests/calls/emails
D5	Data Migration	C16	Forms and Inventory Information Migration
D6	Future Changes	C17	Changes to the system to meet new demands

The Business Analyst Team has developed these deliverables based on the functional and non-functional requirements that was outlined by the key stakeholders for the Inventory Management System. The team has decided to bring forth multiple possible solution approaches that will be structured and organized using the provided deliverables above as a basis for the new Inventory Management System.

### 2.3.1 Fully Integrated In-House Approach

The fully integrated in-house solution will be developed and produced by the new IT department within Little Stars. As a result, using this solution approach allows Little Stars to have full control and ownership over the solution. By choosing an in-house approach, implementation of all functional and non-functional requirements and features will be possible. Furthermore, this solution not only allows Little Stars to implement their needs, but also allows them to adhere to the set standards of Childcare Legislators.

Modifications towards the new Inventory Management System will also be less complicated and less restrictive. This gives Little Stars the flexibility to freely modify the new Inventory Management System when additional future requirements are needed. Additionally, applying an in-house approach means that the solution will not be available to the competitors of Little Stars which gives Little Stars the opportunity to implement unique functionality and features, giving Little Stars competitive advantage over existing solutions.

Ultimately, choosing a fully integrated in-house approach guarantees Little Stars lower costs but also gives not only the IT department, but the staff and other stakeholders of the Inventory Management Process a further in depth understanding of the system which allows for easier maintenance and troubleshooting of the new system.

The fully integrated in-house approach will be comprised of four phases:

#### **Hiring and Department Setup Phase (6 months)**

- IT manager, software development and support teams will be hired and be working alongside existing staff

- On-boarding process is developed and implement for new members in order to give them the full understanding of the requirements of the new Inventory Management System and other important information regarding the project such as roles etc.

**Development Phase (1 year)**

- The newly formed IT department will work through to complete the functional and non-functional requirements based on the given priorities
- Setup for the necessary hardware and components

**Implementation Phase (4 months)**

- Hardware and the new Inventory Management software that was developed will be installed
- Data migration of all physical and digital mediums will be migrated over to the new system
- Training of existing and new staff will be mandatory in order to understand and maximise the full potential of the new Inventory Management system developed

**Post Implementation Phase (Ongoing)**

- IT department will closely monitor the new software by testing and bug finding during off-peak periods
- IT department will be providing continuous internal support for staff through the means of requests, calls, and emails

The table below provides a quick summary of the advantages and disadvantages of implementing a fully integrated in-house solution approach.

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• Allows Little Stars high control over the system’s functionality, development, support, and maintenance</li> <li>• Allows for full implementation of the required functionalities and features</li> <li>• Better integration and alignment with Little Stars goals and objectives</li> <li>• Easier and faster communication for development team</li> <li>• Full control over the quality of work</li> </ul>	<ul style="list-style-type: none"> <li>• Cost of labour as Little Stars requires to hire additional staff to form the new IT department in order to implement the system</li> <li>• Current staff may lack the skills then implement an in-house approach</li> <li>• Development of the system may go out of scope and exceed the time frame caused by the possible lack of skill and expertise from the IT department</li> </ul>

**2.3.2 COTS Approach**

The second possible solution is a Commercial Off-The-Shelf (COTS) approach. This solution would be purchased from an existing Inventory Management software vendor Orderhive.

Orderhive is an Inventory Management software owned by Cin7 Limited which focuses fully integrated, cloud-based inventory management software (Cin7, n.d.). Based in the USA, Orderhive’s Inventory Management software is billed monthly having multiple plans with varying prices ranging from \$95 to \$500 USD per month (also has yearly billing).

A COTS approach would allow Little Stars with significant opportunities for efficiencies when it comes to implementation. The approach will be of an advantage for Little Stars as utilising a COTS approach would result in being cost effective, which ultimately results in less implementation and financial risks. Furthermore, it allows Little Stars to efficiently reallocate the current resources to be utilised for other operations within the company. Applying this COTS approach will also allow the new Inventory Management system to be supported by Little Stars registered suppliers.

The COTS approach would significantly reduce the project time needed to develop the new Inventory Management System. Meaning the development phase will be partially or completely be eliminated which in turn, allows the implementation phase of the new Inventory Management system to commence earlier. The time saved gives Little Stars the opportunity to utilize the new system sooner.

A problem surrounding with a COTS approach is its incompatibility when implementing into a current infrastructure. However, as Little Stars does not have a proper system, Little Stars will not encounter this said problem. Additionally,

Orderhive allows for easier data migration as it has in-built features in order to assist users with migrating data from excel spreadsheets which is the current medium that Little Stars is utilising.

The COTS approach will be comprised of three phases:

**Product Negotiation (3 weeks)**

- The Business Analyst team and Board will contact Orderhive to discuss meetings and demonstrations about the functions of the Orderhive software
- The Business Analyst team and Board will discuss with Orderhive about all the functional requirements given and other important matters regarding the solution

**Implementation Phase (4 weeks)**

- One time payment of \$250 USD to receive expert guidance with a senior onboarding specialist from Orderhive. This includes training for up to 3 chosen staff of Little Stars during the 4-week collaboration and training calls. Calls are twice a week.
- Training for IT department based on the training given to the three chosen staff
- Installation and Integration of the new system to every branch of Little Stars
- Data Migration is performed as Orderhive’s Inventory Management software has data migration assistance
- Integration of software with registered suppliers

**Post Implementation Phase (Ongoing)**

- Training of staff regarding the new software solution
- External support through chat, emails, and calls provided by Orderhive
- Software updates provided by Orderhive

The table below provides a quick summary of the advantages and disadvantages of implementing a COTS solution approach.

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• Orderhive is one of the most popular and highly rated Inventory Management software solutions available</li> <li>• Common and required functionalities and features are well defined and executed</li> <li>• Includes a plethora of additional features which can be utilised for Little Stars advantage</li> <li>• Built-in data migration assistance</li> </ul>	<ul style="list-style-type: none"> <li>• Little Stars does not have full internal control</li> <li>• Negotiations may be time consuming</li> <li>• Does not fully fulfil C15 (remote and training external IT support) as it is only available on the most expensive option. However, chat, email, and phone is still available</li> <li>• May not fully adhere to the standards set by Childcare legislators</li> </ul>

**2.3.3 Outsourcing Approach**

The next solution approach that the Business Analyst team decided on is an outsourcing approach. This approach will be contracted from the custom software development and IT consulting company ScienceSoft. ScienceSoft is a USA based company, they have been chosen as ScienceSoft has 33 years’ experience with custom software development (ScienceSoft, n.d.). Furthermore, ScienceSoft already has advanced solutions for developing custom inventory management software.

By implement an Outsourcing approach, the solution that will be developed by ScienceSoft will be uniquely made for Little Stars. This approach will grant competitive advantage for Little Stars compared to using a Commercial off-the-shelf software solution as custom made software allows for the development of the exact functional requirements based on the business needs of Little Stars. Since Little Stars does not currently have a proper inventory management, applying ScienceSoft’s custom inventory management system will not be difficult and can be easier to adapt across the whole company. Furthermore, post implementation support and development are highly supported as staff from ScienceSoft will be available for assistance. In addition, ScienceSoft offers a team augmentation service in which they will provide the

staff of Little Stars the necessary resources in order to complete any missing and required skill sets of any role for the project (ScienceSoft, n.d.)

ScienceSoft’s 33 years of experience and expertise within the industry has also allowed them to define standard and important factors that help companies maximise their return on investment (ScienceSoft, n.d.). High level of workflow automation is one of the factors that they have defined which is highly beneficial for Little Stars as it will greatly reduce manual work, therefore increasing the overall efficiency of the inventory management process. Furthermore, ScienceSoft has an extremely vast service scope such as software development consulting, software selection, software architecture assessment and redesign etc.

The Outsourcing approach will be comprised of four phases:

**Consultation, Planning & Initial Spec (1 month)**

- The Business Analyst team and Board will have meetings and consultations with ScienceSoft to define the inventory management software functionalities based on the functional requirements and non-functional requirements and business needs of Little Stars
- ScienceSoft prepares a project plan for the development of the new inventory management system
- ScienceSoft will choose the best-fitting tech stack for the new system
- ScienceSoft will design a secure software architecture and create UX and IU mock-ups

**Development Phase (1 year)**

- The ScienceSoft Development team will work through to complete the functional and non-functional requirements based on the given priorities for the new Inventory Management Software
- Setup for the necessary hardware and components
- ScienceSoft to conduct bug tests

**Implementation Phase (1 month)**

- Automated and Manual Data migration of all physical and digital mediums will be migrated over to the new system
- Installation and Integration of the new system to every branch of Little Stars
- Training of all relevant staff for the new system

**Post Implementation (Ongoing)**

- ScienceSoft will provide continuous post implementation support and evolution based on future additions to features business requirements

The table below provides a quick summary of the advantages and disadvantages of implementing a Outsource solution approach.

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• ScienceSoft has vast experience when it comes to developing not only custom software but has dedicated solutions for developing custom inventory management software.</li> <li>• The solution is unique to Little Stars</li> <li>• Allows Little Stars to reallocate resources to other matters</li> </ul>	<ul style="list-style-type: none"> <li>• Negotiations may be time consuming</li> <li>• Can be costly for Little Stars if poor communication occurs when defining business needs and requirements</li> </ul>

**2.3.4 SaaS Approach**

The final solution approach is a Software as a service (or SaaS) approach. A SaaS solution, as opposed to in-house or custom off-the-shelf software solution is a cloud-based inventory management system. Meaning, the system can be accessed anywhere by any user given the user has internet access and a web browser. The Business Analyst team has chosen the SaaS Zoho’s Cloud based Inventory Management system. Zoho Corporation is based in India with multiple offices worldwide. Zoho currently has over 75 million users (Zoho, n.d.)

The SaaS approach will be comprised of three phases:

**Product Negotiation (3 weeks)**



- The Product Negotiation Phase will be identical as the COTS Product Negotiation Phase. The Business Analyst team and Board will contact Zoho to discuss meetings and demonstrations about the functions and features of the Zoho inventory management system
- The Business Analyst team and Board will discuss with Zoho about all the functional requirements given and other important matters regarding the solution

**Implementation Phase (4 weeks)**

- One time payment of \$999 USD for Zoho’s expert plan on their Expert program. Zoho will provide on boarding. This also include four training sessions, 8 hours of training and 2 hours of setup assistance. Furthermore, Zoho will also take care of data migration and integration.

**Post Implementation Phase (Ongoing)**

- Internal Training of staff regarding the new software solution
- External support through chat, emails, and calls etc. provided by Zoho
- System updates provided by Zoho

The table below provides a quick summary of the advantages and disadvantages of implementing SaaS solution approach.

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• Zoho’s Expert Program allows Little Stars can reallocate resources to other matters since Zoho will provide implementation, data migration, integration and training</li> <li>• The new system can be accessed anywhere as long as the user has internet and a web browser</li> </ul>	<ul style="list-style-type: none"> <li>• Negotiations may be time consuming</li> <li>• No control over the development, features needed may not be present, only relying on updates given out by Zoho</li> <li>• Costly</li> </ul>

2.3.5 Feasibility Analysis

The purpose of conducting a Feasibility Analysis for the development project of the new Inventory Management System is to determine that the project is viable. This section will discuss and analyse the Operational, Technical, Schedule, and financial feasibility of the project. This feasibility analysis is important as it will assess and compare the four provided solution approaches that the Business Analyst team has provided.

The Business Analyst team has utilized Forced Pair Analysis to conduct the feasibility analysis for Operational and Technical feasibility of the solutions. Forced Pair Analysis has been utilized as it is an effective way of comparing a small sample size of options. Hence, making it easy to rate and rank each solution in order to determine which one is more viable for operational and technical feasibility.

The Forced Pair Analysis is conducted with the aid of a matrix (as seen on the Operational and Technical Feasibility Analysis later on). The four solution approaches that the Business Analyst team has provided will be listed on both the column headers and row headers of the matrix. The matrix has also been designed in order to avoid comparisons of a solution to itself. Each solution approach has been assigned a letter from A to D respectively. The results of the comparison are then collated in order to determine importance of each solution approach.

*Operational Feasibility*

The following questions were used by the Business Analyst team as a guide in order to rank the four approaches in the Forced Pair Analysis Matrix for Operational Feasibility.

1. How well are the business needs met by each solution approach?
2. How receptive is Little Stars to change from their current Inventory Management System to the given solution approaches by the Business Analyst team?
3. How well can the solution approach be sustained?
4. How well are the non-functional requirements met by the suggested solution approach?

### Forced Pair Analysis Matrix for Operational Feasibility:

	A: In-House Solution	B: COTS Solution	C: Outsourcing Solution	D: SaaS Solution
A: In-House Solution		B, 2	C, 1	A, 2
B: COTS Solution			C, 2	B, 1
C: Outsourcing Solution				C, 2
D: SaaS Solution				
TOTAL	2	3	5	0

**Legend:** 0 (No Difference Found), 1 (Slightly More Importance), 2 (major difference, much more importance found than the other)

After conducting the Forced Pair Analysis, the team has concluded that the Outsourcing Solution Approach is the most operational feasible. Outsourcing Approach, or option C, was able to meet the four guide questions used in order to determine the importance of each solution.

#### Technical Feasibility

The following questions were used by the Business Analyst team as a guide in order to rank the four approaches in the Forced Pair Analysis Matrix for Technical Feasibility.

1. Does the required skills and technology exist within Little Stars for the solution approach?
  - a. If not, can it be acquired?
2. Are the changes that will be proposed compatible with the current infrastructure of Little Stars?
3. Is Little Stars capable and has the technical expertise to install and operate the solution approach?

### Forced Pair Analysis Matrix for Technical Feasibility:

	A: In-House Solution	B: COTS Solution	C: Outsourcing Solution	D: SaaS Solution
A: In-House Solution		B, 1	C, 1	D, 1
B: COTS Solution			C, 2	D, 1
C: Outsourcing Solution				C, 2
D: SaaS Solution				
TOTAL	0	1	5	2

**Legend:** 0 (No Difference Found), 1 (Slightly More Importance), 2 (major difference, much more importance found than the other)

The Forced Pair Analysis conducted above found that the Outsourcing solution approach was more technical feasible for Little Stars.

#### Schedule Feasibility

The following questions were used by the Business Analyst team as a guide to determine which of the four approaches are feasible based on the schedule.

Questions:

1. Can the solution approach be delivered within the given time constraints for the project?
2. How reasonable is the time frame that Little Stars has provided in order to complete the project?
3. How reasonable is the time frame that is provided by the solution approach?
4. Can the development of the solution approach be delivered in stages?

	A: In-House Solution	B: COTS Solution	C: Outsourcing Solution	D: SaaS Solution
Question 1	No	Yes	No	Yes
Question 2	Fair	Fair	Fair	Fair
Question 3	Fair	Fair	Fair	Fair
Question 4	Yes	Yes	Yes	Yes

### Financial Feasibility

The Business Analyst team examined the overall estimated costs of each solution along with how each compare to the expected benefits it delivers to determine which of the four solution approaches are financially feasible.

	Costs	Benefits
<b>A: In-House Solution</b>	<b>Software:</b> \$100,000 <b>Hardware:</b> \$5,000 <b>Hiring:</b> \$125,000 <b>Training:</b> \$2,000 <b>Total:</b> <b>\$232,000 USD → \$325,658.40 AUD</b>	<b>Tangible Benefits:</b> <ul style="list-style-type: none"> <li>Improved Process</li> <li>Improved Data Quality and Accessibility</li> </ul> <b>Intangible Benefits:</b> <ul style="list-style-type: none"> <li>Increased Efficiency</li> <li>Improved staff satisfaction</li> </ul>
<b>B: COTS Solution</b>	<b>Software:</b> \$295/mo or \$3,540/yr USD <b>One Time Charge for Expert Assistance:</b> \$250 USD <b>Hardware:</b> \$5,000 <b>Training:</b> Part cost included in Expert Assistance fee <b>Total: \$7,782.41 AUD</b>	<b>Tangible Benefits:</b> <ul style="list-style-type: none"> <li>Cost and Time Savings</li> <li>Reduction time in manual tasks due to automation</li> </ul> <b>Intangible Benefits:</b> <ul style="list-style-type: none"> <li>Training</li> <li>Improved staff satisfaction</li> </ul>
<b>C: Outsourcing Solution</b>	<b>Software:</b> \$90,000 USD → \$129,159 AUD  <b>Hardware:</b> \$5,000 AUD  <b>Training:</b> \$2,000 USD → \$2,871 AUD  <b>Total: \$137,030 AUD</b>	<b>Tangible Benefits:</b> <ul style="list-style-type: none"> <li>Reduction time in manual tasks due to automation</li> <li>Custom tailored IU</li> <li>Inventory Cost savings and stockout costs eliminated up to 100% (ScienceSoft, n.d.)</li> <li>Improved ROI</li> <li>Reduced Shipping Costs due to more efficient stock ordering: \$20,000</li> </ul> <b>Intangible Benefits:</b> <ul style="list-style-type: none"> <li>Increased Efficiency</li> <li>Improved staff satisfaction</li> </ul>
<b>D: SaaS Solution</b>	<b>System:</b> \$199/mo USD <b>One Time Charge for Expert Program:</b> \$999 USD <b>Hardware:</b> n/a - Existing Hardware are sufficient <b>Training:</b> Included in Expert Program fee <b>Total: \$1,681.87 AUD</b>	<b>Tangible Benefits:</b> <ul style="list-style-type: none"> <li>Offers 14-day trial period</li> <li>Cost and Time Savings</li> <li>Hardware cost savings</li> </ul> <b>Intangible Benefits:</b> <ul style="list-style-type: none"> <li>Training</li> <li>Improved staff satisfaction</li> </ul>

The financial feasibility analysis conducted illustrates the expected costs and some benefits of each of the four provided solution approaches. It was concluded that option C, Outsourcing approach, is the financially feasible solution for Little Stars.

### Inventory Management Feasibility Analysis Conclusion

After analysing and comparing each solution approach, it has been decided that option C, Outsourcing approach, is the most suitable option for Little Stars as it is operationally, technically, feasible and is also feasible with Little Stars Schedule and Finance.

## 2.3.6 Ranking Solution Approach

### Acceptance Criteria

- J. The new Inventory Management system must have inventory request forms digitalized
- K. The new Inventory Management system must allow for easier inventory request form approval in between each user
- L. The new Inventory Management system must allow for automatic stock level updates in the inventory list
- M. The new Inventory Management system must allow for easier searching and ordering through the registered suppliers
- N. The new Inventory Management system must allow for easier stock searching and checking
- O. The new Inventory Management system must have a way to monitor the progress of a request

### Evaluation Criteria

- P. The new Inventory Management system must not allow staff to have the same level of access as purchasing officer
- Q. The new Inventory Management system must take no longer than 2 seconds for any internal database calls and updates
- R. The new Inventory Management system must take no longer than 10 seconds to search for any stock availability from any of the registered suppliers

### Weighted Solution Comparison

The Business Analyst team has given each acceptance and evaluation criteria a letter respectively. Additionally, the team has allocated a weight to each one based on their importance with a scale from 1-10, 1 being least important, 10 being the most. These were then used in order to perform the weighted comparison for each solution approach.

	A	B	C	D	E	F	G	H	I	TOTAL
<b>WEIGHT</b>	9	8	9	8	8	6	9	8	6	
<b>In-House</b>	Y	Y	Y	Y	Y	Y	Y	Y	Y	71
<b>COTS</b>			Y	P	Y		P	Y		33.5
<b>Outsource</b>	Y	Y	Y	Y	Y	Y	Y	Y	Y	71
<b>SaaS</b>			Y	P	Y		P	P		30

#### Legend:

“Y” will receive full weight marks as it meets the full criteria

“P” will receive half weight marks as it partially meets the criteria

Solution	Score	Cost	Months	Over/Under Budget	Budget	Implementation on Time	Total (Score+Budget+Imp Time)
<b>In-House</b>	71	\$325,658.40	24	\$125,658.40	-6.28	-12	52.72
<b>COTS</b>	33.5	\$7,782.41	1.6	\$192,217.59	9.61	10.4	53.51
<b>Outsource</b>	71	\$137,030	14	\$62,970.00	3.15	-2	72.15
<b>SaaS</b>	30	\$1,681.87	1.6	\$198,318.13	9.92	10.4	50.32

### Assumptions & Constraints

- Budget would be \$200,000 AUD and Solution Delivery will be 12 months
- Cost figures are only upfront costs, running costs such as monthly or yearly billed subscriptions and maintenance costs has not been considered
- Each cost of the solution will remain stagnant and not fluctuate

### Ranking Solution Approach Conclusion

The Outsourced solution approach has been chosen by the Business Analyst team as the suggested solution approach for the new Inventory Management system. The Outsourced approach was deemed operationally and technically feasible while meeting the schedule and finances required by Little Stars. Furthermore, the Outsourced Approach ranked the highest after conducting the weighted solution comparison against the three other solution approaches.

## 3. Solution Assessment

### 3.1 Final Solution Selection

#### 3.1.1 Ranking Final Solution Approach

The final solution chosen will be from the recommended solutions from each of the individual solution approaches. These will be compared on their operational, schedule, technical and financial feasibility. If the budget permits, then multiple of the top ranked solutions will be implemented

#### *Feasibility Assessment*

The following questions were used by the Business Analyst team as a guide to rank the three approaches in the Forced Pair Analysis Matrix for Operational Feasibility. For each of the questions how well the solution approach did on the question is rated out of 10.

1. A: How well are the business needs met by each solution approach?
2. B: How receptive is Little Stars to change from their current system to the given solution approaches by the Business Analyst team?
3. C: How well can the solution approach be sustained?
4. D: How well are the non-functional requirements met by the suggested solution approach?

	A: Fee Payment In/Out Mix	B: Inventory Management Outsourcing	C: Leave Management SaaS
Question 1	8	10	5
Question 2	9	9	4
Question 3	8	10	7
Question4	7	10	4

The fee payment system is incredibly feasible due to the “Outsourced Website Creation with In-House Support” of the fee payment website meeting all of the business needs bar being able to automatically perform data migration. As the solution keeps all of the existing staff and adds an outsourced website creation, parents will be happy with familiar voices, the board will be happy with not having to rehire and the payment clerks will still have a job. The approach can be sustained as it is long term with Strong (the outsourced company) being able to handle scaling, and the IT support staff team large enough to handle problems. The non-functional requirements are met since Strong have a background in making stable and responsive websites that integrated into systems.

After conducting a Forced Pair Analysis in order to determine the Operational Feasibility of the Inventory Management System, it was found that the Outsourcing solution approach was exceedingly viable and feasible as it was able to perfectly meet Little Stars business needs and requirements. The proposed outsourcing solution not only solves the current issues, but also allows for more opportunities to expand. The new system will also be able to integrate within Little Stars current inventory management structure and business environment. Furthermore, since ScienceSoft, the outsourcing company for the solution approach, has an extensive portfolio and experience within the industry, it is without a doubt that they are more than capable of not only delivering the functional requirements, but also the non-functional requirements necessary for the solution. Finally, ScienceSoft is able to provide post-implementation support and product evolution making the approach very sustainable.

From this all of the proposed systems do indeed rank highly for the questions of operational feasibility meaning they are all feasible solutions. However, inventory management was rated 7 greater than Fee Payment, meaning that the Outsourcing approach for inventory management is more feasible. For leave management, it was 12 behind Fee Payment and 19 behind Inventory Management thus is the least feasible of the solutions.

*Forced Pair Analysis Matrix for Operational Feasibility*

	<b>A: Fee Payment In/Out Mix</b>	<b>B: Inventory Management Outsourcing</b>	<b>C: Leave Management SaaS</b>
<b>A: Fee Payment In/Out Mix</b>		A, 1	A, 2
<b>B: Inventory Management Outsourcing</b>			B, 2
<b>C: Leave Management SaaS</b>			
<b>TOTAL</b>	<b>3</b>	<b>2</b>	<b>0</b>

**Legend:** 0 (No Difference Found), 1 (Slightly More Importance), 2 (major difference, much more importance found than the other)

*Technical Feasibility*

The following questions were used by the Business Analyst team as a guide to rank the three approaches in the Forced Pair Analysis Matrix for Technical Feasibility.

5. Does the required skills and technology exist within Little Stars for the solution approach?
  - a. If not, can it be acquired?
6. Are the changes that will be proposed compatible with the current infrastructure of Little Stars?
7. Is Little Stars capable and has the technical expertise to install and operate the solution approach?

	<b>A: Fee Payment In/Out Mix</b>	<b>B: Inventory Management Outsourcing</b>	<b>C: Leave Management SaaS</b>
<b>Question 5</b>	10	10	8
<b>Question 6</b>	6	9	3
<b>Question 7</b>	8	10	7

The fee payment system is being outsourced meaning that the outsourcing company of Strong will be able to build the solution rather than Little Stars. The current infrastructure of Little Stars will need to be changed with a technical support centre for the IT payment clerks set-up. Strong promises to train these clerks to know how to use the new system, but the computer set-up will need to be done by them as this was slightly ambiguous. Once trained, the IT payment clerks will be able to support the website meaning all those in and outside the company can use it.

As the proposed solution for the Inventory management is from the outsourcing company of ScienceSoft, their company is more than capable of developing and implementing the solution for Little Stars as they have vast experience in the industry with major partners such as eBay and NASA. Furthermore, ScienceSoft offers a team augmentation service in which they provide all the necessary resources for the staff in order to complete any of the required skill set of a project. Meaning, the current staff of Little Stars can be trained if needed, to install and operate any hardware and software required by ScienceSoft’s developed solution without the need of changing the current infrastructure of Little Stars.

From this all of the proposed systems do indeed rank highly for the questions of technical feasibility meaning they are all feasible solutions. However, inventory management was rated 5 greater than Fee Payment, meaning that the Outsourcing approach for inventory management is more feasible. For leave management, it was 6 behind Fee Payment and 11 behind Inventory Management thus is the least feasible of the solutions.

**Forced Pair Analysis Matrix for Technical Feasibility:**

	<b>A: Fee Payment In/Out Mix</b>	<b>B: Inventory Management Outsourcing</b>	<b>C: Leave Management SaaS</b>
<b>A: Fee Payment In/Out Mix</b>		0	A, 1
<b>B: Inventory Management Outsourcing</b>			B, 1
<b>C: Leave Management SaaS</b>			

<b>TOTAL</b>	<b>1</b>	<b>1</b>	<b>0</b>
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**Legend:** 0 (No Difference Found), 1 (Slightly More Importance), 2 (major difference, much more importance found than the other)

### Schedule Feasibility

The following questions were used by the Business Analyst team as a guide to determine which of the four approaches are feasible based on the schedule.

Questions:

8. Can the solution approach be delivered within the given time constraints for the project?
9. How reasonable is the time frame that Little Stars has provided in order to complete the project?
10. How reasonable is the time frame that is provided by the solution approach?
11. Can the development of the solution approach be delivered in stages?

	A: Fee Payment In/Out Mix	B: Inventory Management Outsourcing	C: Leave Management SaaS
<b>Question 8</b>	8	9	8
<b>Question 9</b>	4	10	8
<b>Question 10</b>	8	10	5
<b>Question 11</b>	6	10	1

Strong's suggested timeline will have functionality within the year. This exceeds the 6-month expectation but since the entire solution is delivered before a year this makes up for it. This 6-month expectation is unreasonable and unfortunately may upset the board that the requested functionality has not been delivered in time. The time frame proposed by the solution is entirely reasonable due to Strong using their own custom-pre-made templates with the functionalities required already existing in prior websites they have built. While it cannot be delivered in stages, it makes up for it that the 2-year desired features are present in the before 1-year launch.

The provided timeline for the implementation of the outsourced solution by ScienceSoft is only over by two months compared to the 1 year that Little Stars has given for the project. The given timeline provided by ScienceSoft is reasonable as their value and worth is enough. Hence, both the provided timeline of ScienceSoft and Little Stars are reasonable. Furthermore, as the given timeline is sufficient, the delivery of the approach can be done in stages.

From this all of the proposed systems do indeed rank highly for the questions of schedule feasibility meaning they are all feasible solutions. However, inventory management was rated 13 greater than Fee Payment, meaning that the Outsourcing approach for inventory management is more feasible. For leave management, it was 5 behind Fee Payment and 17 behind Inventory Management thus is the least feasible of the solutions.



Financial Feasibility

The Business Analyst team examined the overall estimated costs of each solution along with how each compare to the expected benefits it delivers to determine which of the three solution approaches are financially feasible.

	Costs	Benefits
<b>A: Fee Payment In/Out Mix</b>	<p><b>Initial Cost:</b>                      Little Stars System Website: \$30,000.00                      Hardware: \$1,000.00                      Training: \$5,416  <b>Initial Cost: \$36,416</b></p> <p><b>Further Costs:</b>                      Hardware: \$2,499.00                      Training: \$5,416.67                      IT Support: \$16,489.00                      Data Migration: \$5,416.67                      Future Changes: \$3,000.00  <b>Total Yearly Costs: \$28,758</b>  <b>Total 5 Year Cost: \$135,202 AUD</b></p>	<p><b>Tangible:</b>                      Increase in childcare scheduling: \$240,000.00                      Increased product purchases due to ease of purchase: \$50,000.00                      Debt Tracking able to gain missed payments: \$24,000.00                      Better Management via Analytics leading to better sales: \$3000                      Fewer Parent Complaints leading to referrals: \$24,000.00                      Fewer fee payment forms for out-of-stock items which won't be fulfilled: \$1,000.00  <b>Total Value: \$342,000.00 +- 20%</b></p> <p><b>Intangible Benefits:</b>                      Time savings for clerks and parents                      Improved parent happiness</p>
<b>B: Inventory Management Outsourced</b>	<p><b>Initial Cost:</b>                      Software: \$129,159                      Hardware: \$5,000                      Training: \$2,871 AUD  <b>Initial Cost: \$137,030</b></p> <p><b>Further Costs:</b>                      Hardware: \$2,500                      IT Support: \$28,790                      Future Changes: \$5000  <b>Total Yearly Costs: \$31,290</b>  <b>Total 5 Year Cost: \$256,870 AUD</b></p>	<p><b>Tangible Benefits:</b>                      Reduction time in manual tasks due to automation                      Custom tailored IU                      Inventory Cost savings and stockout costs eliminated up to 100% (ScienceSoft, n.d.)                      Improved ROI                      Reduced Shipping Costs due to more efficient stock ordering: \$20,000</p> <p><b>Intangible Benefits:</b>                      Increased Efficiency                      Improved staff satisfaction</p>
<b>C: Leave Management SaaS</b>	<p><b>Ongoing monthly cost:</b>                      \$10 per user * 50 users = \$500 per month</p> <p><b>Hardware:</b>                      n/a - Existing Hardware is sufficient</p> <p><b>Training:</b>                      \$5000</p> <p><b>Total:</b>  <b>Total Yearly Cost: \$12000</b>  <b>Total 5 Year Cost: \$60,000</b></p>	<p><b>Tangible Benefits:</b>                      Reduction time in manual tasks due to automation                      Faster leave turnaround meaning teaching and HR staff have more time to perform other tasks</p> <p><b>Intangible Benefits:</b>                      Training                      Improved user experience</p>



The financial feasibility analysis conducted illustrates the expected costs and some benefits of each of the four provided solution approaches. It was concluded that fee payment out/in mix was the most cost effective in relation to the tangible and intangible benefits received. This is mostly due to it being both internal and external to the company, meaning it provides benefits to the staff like the inventory management and leave management system, but then also increases revenue directly from parents via multiple revenue streams. The inventory management was then the second most cost effective as it provides increased benefits over the leave management process.

*Feasibility Analysis Conclusion*

#After analysing and comparing each solution approach, it has been decided that option C, Outsourcing #approach, is the most suitable option for Little Stars as it is operationally, technically, feasible and is also #feasible with Little Stars Schedule and Finance.

*Weighted Solution Comparison*

The business analyst team has given each question in feasibility analysis a number. This number was then weighted from 1 to 10 with 10 being the most important and 1 being the least. Each of the solutions have their feasibility answers transferred into the weighted solution comparison table to have a final score.

Acceptance and evaluation criteria a respectively. Additionally, the team has allocated a weight to each one based on their importance with a scale from 1-10, 1 being least important, 10 being the most. These were then used in order to perform the weighted comparison for each solution approach with a weight. A weight of 10 was a 1 and a weight of 3 was 0.3 for scale.

	1	2	3	4	5	6	7	8	9	10	11	TOTAL
<b>WEIGHT</b>	10	5	2	6	8	7	9	9	3	6	8	
<b>Fee Payment In/Out Mix</b>	8	9	8	7	10	6	8	8	4	8	6	55.7
<b>Inventory Management Outsourced</b>	10	9	10	10	10	9	10	9	10	10	10	70.9
<b>Leave Management SaaS</b>	5	4	7	4	8	3	7	8	8	5	1	39

Solution	Score	5 Year Cost	Months	Over/Under 5 Year Budget	Value	Implementation on Time	Total (Score+ Value+ Imp Time)
<b>Fee Payment In/Out Mix</b>	55.7	\$135,202	7	\$486,664	20.45	5	81.15
<b>Inventory Management Outsourced</b>	70.9	\$256,870	14	\$408,130	20.41	-2	89.31
<b>Leave Management SaaS</b>	39	\$65,000	2	\$585,000	29.25	10	78.25

+1 point was given for every month before expected realistic time of a year and -1 for every month afterward. +1 point was given for every 20k under budget and -1 point for ever 20k over budget for the total cost over a period of 5 years, with the price set being \$133k times 5 (\$665k).

*Assumptions & Constraints*

All of the assumptions regarding the solutions in the individual sections apply

*Ranking Solution Approach Conclusion*

The Fee Payment In/Out Mix and Inventory Management Outsourced had very similar total scores and both were under the budget and thus can be implemented simultaneously. As the feasibility analysis for the inventory management system outscores the fee payment service due to the providers of the outsourced inventory management system “ScienceSoft” being a more reputable, diversely skilled and capable company that “Strong”, it makes logical sense to instead of having two separate outsourcing companies, it would be better to compare them to choose which one of these companies will have the outsourcing contract for both of the solutions, if this is even possible. Having only one company providing outsourcing for both will result in better communication for Little Star due to only needing one point of contact for both software creation as well as IT support. It will also mean that both of these systems, in this case the inventory management system and the fee payment system, will be integrated which makes a lot of sense since the inventory management system will need to handle the influx of orders for products.

“Strong” Advantages	“ScienceSoft” Advantages
<ul style="list-style-type: none"> <li>• Smaller team so more focused on Little Star since they may be their only client at the time</li> <li>• Costs less</li> <li>• Quicker implementation time for fee payment system</li> </ul>	<ul style="list-style-type: none"> <li>• Larger company with over 700 people meaning more people can be dedicated to project</li> <li>• 20+ years more experience than Strong</li> <li>• Worked with massive clients such as eBay</li> <li>• Is able to produce both websites and software systems</li> <li>• Still cost and time effective</li> </ul>

“Strong” Disadvantages	“ScienceSoft” Disadvantages
<ul style="list-style-type: none"> <li>• Does not provide software thus would be unable to do both a fee payment and the desired inventory management system</li> <li>• Less experienced</li> <li>• Very small team with no guarantee of dedication to only one client at a time</li> <li>• Is ambiguous surrounding training of support staff in-house</li> <li>• Is unable to provide an automated data migration system</li> </ul>	<ul style="list-style-type: none"> <li>• Costs more</li> <li>• Longer development time</li> </ul>

From these advantages and disadvantages, it is obvious that Strong would be incapable of providing outsourcing, while “ScienceSoft” would be able to reliably provide both the fee payment website as well as the inventory management software to a standard that would fulfill the business needs. While “ScienceSoft” does cost more, the same price estimates can be used for the fee payment system software as the Inventory Management Software, with the inventory management software estimates still going underbudget. The development schedule will also be extremely similar with the fee-payment system being developed in unison, with “ScienceSoft” having enough employees to be working on both systems simultaneously. In conclusion, the fee payment system with outsourcing of website creation and in-house support team, combined with the inventory management system with outsourcing, outsourced by the same provider “ScienceSoft”, will be the recommended solution for Little Stars. From this point forward the solution will be referred to as the “Fee and Inventory Combined Solution”.

## 3.2 Solution Scope

### 3.2.1 New Capabilities

The proposed Fee and Inventory Combined Solution will encompass a complete overhaul of the fee payment system that is currently paper-based and handled by payment clerks, as well as the inventory management system which also uses a mix of paper-based forms and utilizes excel spreadsheets for stock management which is manually operated by the purchasing officer. A single login system will handle the accounts of parents, payment clerks, IT support clerks, the board, purchasing officer and operations manager. For parents, the fee payments will be handled through an online portal after logging into their account. Outstanding payments such as tuitions and products that their children used during class will appear in the “outstanding payments” portal. Parents will be able to click on an outstanding payment, choose a payment method of PayPal or Credit Card, enter their payment details and then pay for the outstanding fee. These payment details will be saved for future use. Parents will also have a products cart and are able to view the range of products that are currently being offered by Little Stars for their children and these will also be able to be purchased.

For the counter staff, the online portal will be similar except they will be able to search up parent’s accounts based on their name or their children’s name. They will have a similar looking outstanding fees screen for each parent’s account and be able to click on an outstanding fee, and have the parent pay for it at the counter, cash and debit card accepted, paying for the outstanding fee. This system also works with purchasing products for their child, where a products page will be available, a cart, and the items requested by the parent will be added to the cart, and the cart paid for by the parent. Invoices would be produced once items are purchased for parents as a receipt, and in a database format to have previous purchases remembered and accessible by the inventory management system.

On-top of this fee payment system bookings for the casual day care service can be made, with the number of available spots listed for days and times available. Parents can book in advanced online or in office, or simply tell the staff at the office when they are dropping off their child that they will be being dropped off so that they can book the child in on the spot via searching for the parent and booking them in. This means that payments do not need to be made at the point of time since it is simply on record as another part of outstanding fees that need to be paid.

The board members will have access to changing the product and tuition costs on the website through their accounts with a portal with the products page allowing them to edit, add or remove products from sale. These products will then be selectable to see what products are being bought, when and how much. Site usage information will also be available in another screen displaying what pages are visited, when and how often.

In regards with the inventory management system and its relationship with the fee payment system, inventory request forms will now all be fully digital. Staff will have access to these forms on the new website which would be linked with the new inventory management software developed by ScienceSoft. By having digital inventory request forms, this allows for faster and more efficient form approval between the staff, purchasing officer, and branch manager. In addition, the new software and website will allow each respective user to view the progress of request. Furthermore, the new inventory management system allows for automation. Other features and capabilities of the new inventory management software are full inventory control and stock management, registered supplier and purchase order management, inventory database management, analytics and more.

### 3.2.2 Components Scope

#### UI Pages

The Fee and Inventory Combined Solution will share UI pages including:

- Account details page
- Login page
- Create account page

The parent and payment clerks will both have the UI pages of:

- Outstanding fees list page
- Individual outstanding fee page
- Products page
- Current cart page
- Payment page
- Saved payment details page
- Current available childcare bookings page
- Create/Edit childcare booking page

The payment clerk's UI pages available will be:

- Parent search page
- Child search page
- Gather cash payment page
- Gather debit card payment page

The board UI pages available will be:

- View product statistics page
- View page statistics page
- Create/Edit product page

The purchasing officer pages available will be:

- Inventory Control page
- Stock Management page
- Registered Supplier and Purchase Order Management page
- Inventory Analytics and Report page
- Inventory database management page
- Request Form management page

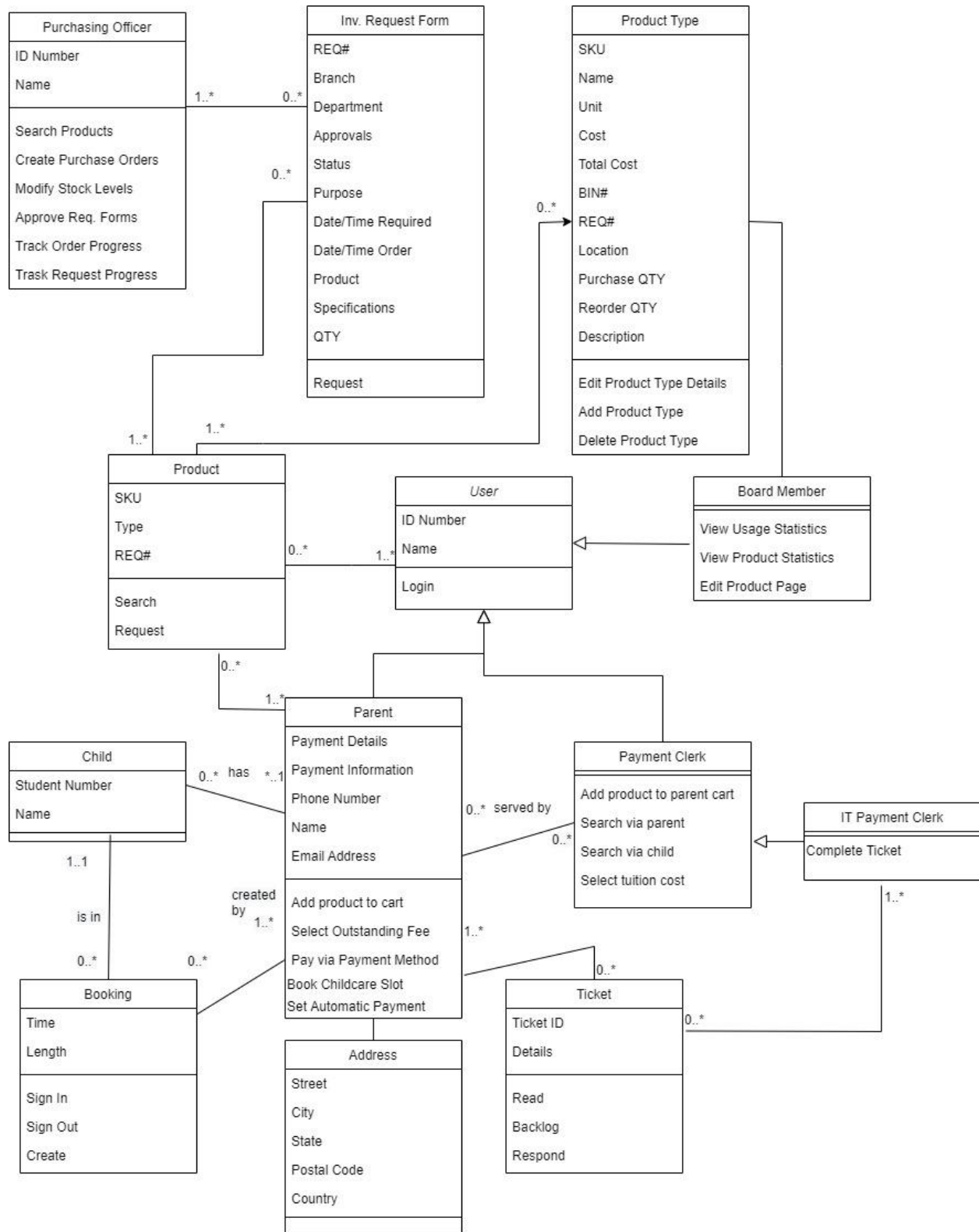
The Purchasing Officer and Staff UI pages that will be shared is the Inventory Request Form, however, both have slightly different access levels for functionality such as:

- Purchasing Officer Form Approval functionality
- Request Progress Form Information Update

Pages that won't be included will be anything to do with the staff leave management. Parents will not have the ability to customize avatars.

#### Database

The database will have quite a complex structure. Using a Class Relationship Diagram these relationships and information pertaining to each class is demonstrated.



Elements that won't be included in the database are customizations to any users' profiles as no avatars will be included. Any classes related to the staff leave management also will not be included. Due to the database structure, the paper records will be converted into the database format instead of being uploaded themselves which is out of scope. The class diagram's limitations mean that there should be an inheritance between User and Purchasing Officer but it would need to wrap around the diagram.

## IT Support Centre

The IT support centre will be being created due to the need for in-house support staff that have the ability to use the new website but also know the old system as well as the customer base. This will need to be set up with:

- A room that can fit 5 people
- Dividers, tables, chairs, and stationery
- 5 computers with screens
- 5 phones with 'hold' and 'call forwarding' capabilities
- A network connection with a router
- A phone line
- Electricity
- The transferred payment clerks who have been trained by "ScienceSoft"

Payment clerks at the counter of each branch will also be getting a computer and will need a network connection, router, debit card scanner and electricity.

Out-of-scope is an redundancy measures or room for more IT payment clerks as having 5 is already a lot for only 1000 parents' concerns, with the testing later meaning there really shouldn't be many calls into the support as parents should be easily able to use the fee payment website.

### 3.2.3 Removals, Reworks and Transitions

In the scope of the Fee and Inventory Combined Solution is the removal of the paper-based system used for the current fee payment process. This system needed to be completed overhauled as it was causing extreme delays. Instead, as mentioned, the payment clerks will be able to access the new system through a computer terminal. The UI pages are very similar to that of the parents themselves with purchasing and tuition payments being able to be processed, with no forms at all, and instead verbal communication and a debit card reader. It is out of scope for those at the counter to be able to pay with crypto currencies or PayPal, as this would slow down the processing time of payments since cash and card are quicker than having the payment clerk manually enter in their PayPal details. However, the payment details will be able to be saved by the counter clerk on the parents request. Parents at home will be able to use the new system which will be a bit of a transition for them.

To aid in the transition from the old fee system to the Fee and Inventory Combined Solution, "ScienceSoft" will be building an automated data migration tool as well to automatically process the existing paper records and transfer them with OCR into the database structure, automatically creating accounts and basically transferring the current informational state into the database. Some manual oversites will still be needed as OCR is not perfect.

The existing payment clerks will be split into two groups, hopefully voluntarily. One group will become the new IT payment clerks and will be upskilled by training from "ScienceSoft" to be able to fully understand the new site, its functionalities and features, to the point where they are easily able to answer questions on it. They will also receive training on how to use computers, answer phones and support tickets. The existing payment clerks will also be taught how to use the site till they are functional and are able to use a computer to transfer in information, as well as use a payment card reader.

As for the training of the purchasing officer and operations manager, ScienceSoft will provide the necessary resources and provide support sessions in order to complete the skillset required for the new inventory management system. To help further aid in the transition, documentation for the solution will need to be able to be created so that parents, staff, clerks, purchasing officer, operations manager, and the board can use it.

Out of scope of the new system transition is advertising based on the upgrade. This may be appealing to Little Stars but the BA team is focused on identifying and producing solutions to fix the problems, rather than promoting that the problems have been fixed. Advertising may help the parents of Little Star transition to the system and use it online more

regularly, but “ScienceSoft” is not a digital marketing agency and their most likely is a marketing agency that Little Stars already uses that will handle advertising.

### 3.2.4 Timing and Budgeting Scope

The time and budgeting scope of the Fee and Inventory Combined Solution will follow extremely similarly to just the Inventory Management Solution. While ScienceSoft does state that they can build a web portal quicker than they can the custom inventory management solution, it would better if they were released in tandem (ScienceSoft Inc, 2022c).

#### **Consultation, Planning & Initial Spec (1 month)**

- The Business Analyst team and Board will have meetings and consultations with ScienceSoft to define the inventory management software and fee payment website functionalities and based on the functional requirements and non-functional requirements and business needs of Little Stars
- ScienceSoft prepares a project plan for the development of the new inventory management system and fee payment website
- ScienceSoft will choose the best-fitting tech stack for the new system
- ScienceSoft will design a secure software architecture and create UX and IU mock-ups

#### **Development Phase (1 year)**

- The ScienceSoft Development team will work through to complete the functional and non-functional requirements based on the given priorities for the Fee and Inventory Combined Solution
- Setup for the necessary hardware and components
- ScienceSoft to conduct bug tests

#### **Implementation Phase (1 month)**

- Automated and Manual Data migration of all physical and digital mediums will be migrated over to the new system
- Installation and Integration of the new system to every branch of Little Stars
- Training of all relevant staff for the new system
- Released in tandem so new purchases don’t overwhelm old systems

#### **Post Implementation (Ongoing)**

- ScienceSoft will provides continuous post implementation support and evolution based on future additions to features business requirements

There are currently no planned upgrades of the system on top of what is already set out in the combined functional and non-functional requirements. To maintain the schedule, double the money will need to be paid to “ScienceSoft” to produce these two pieces of software in tandem and have them integrated together. The maximum budget is set at 400K per year but an expected budget of 266K due to it dealing with 2 of the current problem processes at Little Stars. A rough estimate of the planned budget taken from the individual inventory management solution and doubled is \$513,740 over a 5-year period. This is well under the \$1.3 million budgeted spend for the timeframe. It is out of scope to go beyond the \$1.3 million budget for any reason whatsoever. All upgrade expenses and massive changes if needed should come out less than this number due to the current quoted price of the Inventory Management System.

### 3.2.5 Assumptions and Constraints

It is assumed that the reaction to the Fee and Inventory Combined Solution will be a good one. The organization readiness is analysed later on with the overall cultural assessment leaning towards this being a well-received change. Some of the payment clerks may not want to move to the IT payment clerk role which is unfortunate and will be a constraint on the amount of knowledge and amount of familiar faces and voices in the Fee and Inventory Combined Solution. Externally, the parents have been begging for a change to the current system and even the board has recognized this and wants change. The inventory management system overhaul is also heavily desired so there should only be a small amount of pushback.

Another assumption is that the business case which is laid out below is accurate. All effort has been put into making this accurate with referencing and logical assumptions made about the benefits, costs and risks. There is a lot that is limited



in the inclusion of the software overall since there are only certain things that are being demanded upon by those at Little Stars and the scope of the solutions mainly focuses on those specific elements, possibly leaving out new and out-of-the-box ideas that were not at all mentioned or directly in line with Little Stars stakeholder requests, yet they could help Little Stars significantly. For instance, Little Stars to parent emails are not included in the solution as they were not asked for by any of the stakeholders including parents, with the level communication already existent with Little Stars seeming to be enough. However, without the implementation of this idea, nor its foreseen relevancy to the current problem, it is unknown whether it would significantly increase the new systems usage or not. Another is the integration of subsidizing childcare payments into the fee payment service. This is more related to fee payment processing, but it is completely unknown whether this is at Little Stars or not, and it also makes the fee payment system even more complicated than it already is. It is an assumption that Little Stars is not a government funded childcare centre and does not have any subsidization and thus is not included in the fee payment part of the Fee and Inventory Combined Solution.

As discussed previously, the solution is capable of delivering not only the required business needs and functionalities that Little Stars requested but is also capable of delivering more functions that will greatly benefit the new system for Little Stars. It is assumed that Little Stars and ScienceSoft will discuss to include further, more robust features that previously has not been stated by the stakeholders. Features such as reporting and advanced AI-driven analytics which ScienceSoft offers can be included as part of the features of the new inventory management system.

A possible constraint is the lack of in-person assistance from ScienceSoft. However, as ScienceSoft offers an excellent support service, the lack of possible skill in order to install and operate the new system can be amended. There are also other constraints that include external regulation. There is a strict set of guidelines that are laid out by the Australian Government in “Education and Care Services National Regulations” (Queensland Parliamentary Council, 2021). These regulations while extensive are quite common sense and already covered in the non-functional requirements such as having parents’ information secure. Most of the legislation surrounding it is based on the treatment of the children in childcare centres, the quality and making sure staff are well-trained. The ISO 27001 for information security standards will also need to be applied. However, seeming that “ScienceSoft” are already ISO accredited this should not be an issue. It is an assumption that internal policy and pre-existing contracts do not hinder the Fee and Inventory Combined Solution by having unexpected classes that prevent the moving of staff or that Little Stars has a complete ban on outsourcing or something similar.

### 3.2.6 Dependencies

The dependencies of the solution are mostly handled by “ScienceSoft”. “ScienceSoft” will need to rely on a tech stack of their choice to implement the desired solution. If an update were made to this tech stack, and the Fee and Inventory Combined Solution updated to this tech stack without the prior testing which is needed before an update, this could cause trouble for the solution. The solution is also dependent on “ScienceSoft” abilities as well as their server infrastructure. The solution also relies on electricity to each of branches being stable, as well as an internet connection. The new IT support centre depends on a strong NBN connection and phone line to operate at the main centre. Space will also need to be found for the new department, with it an assumption that this space is available at the main centre. However, to factor for this, rental costs of a small room will be included to make the solution more robust in case external space needs to be found that meets the requirements of the IT support centre.

### 3.2.7 Summary

Overall, the Fee and Inventory Combined Solution combines all the functional and non-functional requirements of the inventory management software and fee payment website, and has it outsourced by one company, “ScienceSoft”. The scope of the project is quite significant but is under budget and should be delivered just after a year. While there are quite a few dependencies, assumptions and constraints, the solution assessment below demonstrates that the solution is a cost-effective, organizationally supported and reasonably easy to transition to solution that will greatly improve users experience with fee payment and inventory management. There is room for the scope of the project to grow to cover more processes but fixing these two processes should bring the most value to Little Stars.



### 3.3 Business Case

#### 3.3.1 Benefits Tangible

Benefit	Estimated Yearly Value	Assumptions and Justification
Increase in childcare scheduling	\$120,000.00	Equivalent of 0.5 days per student per year (reduced due to drop offs usually being for half days)
Increased product purchases due to ease of purchase	\$20,000.00	\$20 per student of extra purchases (Reduced due to discussion that \$50 may be too large an amount)
Debt Tracking able to gain missed payments	\$6,000.00	1/4 child tuition per year (Reduced since likelihood of entire tuition going missing is small since audits do exist)
Increase in quality of childcare due to items available in classrooms leading to parent referrals	\$24,000.00	1 New Student a year from word of mouth
Better Management via Analytics leading to better sales	\$3,000	Improved product pushing and parent wants optimizations. \$3 per child per year
Fewer Parent Complaints leading to referrals	\$24,000.00	1 New Student a year from word of mouth
Fewer fee payment forms for out-of-stock items which won't be fulfilled	\$1,000.00	Amount of missed spending on out-of-stock items per year
Increased product purchases due to quicker fulfillment times	\$20,000	Parents would buy from Little Star more if the items they wanted reached their kids quicker than they can purchase them elsewhere (\$20 per student)
Reduction time in manual tasks due to automation	\$40,000	Manual data migration for fee and management is estimated at 4 months with 2 people, thus 8 months of wages (Altexsoft, 2020)
Easy to use forms being filled out quicker by staff	\$5,000	Equivalent to a months' worth of work each year in form inefficiencies.
Reduced Shipping Costs due to more efficient stock ordering	\$20,000	Estimated increase of shipping cost and loss of parcels due to inefficient stock ordering
Reduction in paper-waste	\$5,000	Stationary and bin-costs (Bean-Mellinger, 2019)
<b>Total Value</b>	<b>\$288,000.00</b>	<b>+/- 20% Estimate</b>

The tangible benefits for the Fee and Inventory Combined Solution result in \$288,000 in benefits each year company-wide. The increase in childcare scheduling, increased product purchases and debt tracking were all reduced from the individual section due to a discussion amongst the BA members that while those estimates could be obtained, it would be better to reassess these benefits. Once this reassessment had occurred, the benefits for these were reduced, but still provide a large enough benefit to warrant the fee payment inclusion. The comparison did not use tangible benefits to judge the best solutions so this will be unaffected.

#### 3.3.2 Benefits Intangible

<b>Intangible</b>	<ul style="list-style-type: none"> <li>• Time savings for clerks and parents</li> <li>• Improved parent happiness from less wait times</li> <li>• Improved parent happiness from being able to automate payments</li> <li>• Increased warehouse efficiency</li> <li>• Improved staff satisfaction with item retrieval</li> <li>• Improved childcare services due to required items being in required rooms on time</li> <li>• Improved staff efficiency from having items available on time</li> <li>• Improved staff efficiency from having more items be available and not out-of-stock</li> </ul>
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A lot of the intangible benefits listed above lead to tangible benefits as seen in the tangible benefits list

### 3.3.3 Benefits Measurements

How well the Fee and Inventory Combined Solution achieves these benefits will need to be measured. This will be quite difficult to how intangible benefits lead to tangible benefits, which may overlap with existing trends, such as an increase in children at the childcare centre per year. KPIs have been created to measure the performance of the solution. Validation techniques will also be used including a parent focus group with questions, and internal warehouse staff survey with questions, a requirements walk-through before launch, site metric collections, unit tests, integration testing, system testing and user acceptance testing.

#### *Key Performance Indicators*

1. 80% of fee payments are conducted online by parents
2. The average time it takes to process a parents outstanding payment from reaching the counter to leaving the counter is less than 1 minute
3. 98% of parents at the counter leave having purchased or paid for the products they came to pay for
4. 100% of parents have accounts within 1 month of the launch
5. The average time it takes for a parent to receive confirmation that their purchase has been completed is less than 1 minute
6. The amount of cancelled automatic payments is less than 2% of the amount of children at Little Stars (currently 20)
7. At least 20% of products added to a cart are followed through and purchased once the cart is in the checkout/payment page
8. There is an increase in overall spending on products for children of \$100 per child
9. At least 3 children more per year are enrolling above current predicted growth measures after the launch
10. 95% of in-stock items to be given to a child from the point of requesting or direct purchasing are delivered to the child's room in less than 48 hours
11. 98% of in-stock items to be given to a parent from the point of requesting or direct purchasing are available at the office for pick-up in less than 36 hours
12. Requests for out-of-stock items are denied on average in less than a 5hrs if a denial is needed
13. Requests for out-of-stock items that are to be refilled are approved, with notice of a lengthy delivery time, on average less than 5hrs
14. At least 3 new products are available to parents to purchase a year after launch and have equal or better sales than the medium selling product
15. All outstanding payments are transferred to the new system at least 4 months after launch
16. No paper-forms exist inside any branch office by 3 months after launch

#### *Parent Focus Group*

To accurately identify the benefits that the parents are experiencing, parent focus groups will be gathered by sending out emails requesting parents meet after childcare hours to discuss their current quality of childcare. Questions related to the Fee and Inventory Combined Solution will consist of:

- How often do you use the fee payment website?
- How often do you purchase items on the website?
- Do you prefer to have the items given directly to your child or to pick them up from the office?
- How do you feel about the website pricing?
- Do you use automated payments? If not, why?
- How are the colours on the webpage?
- Are you able to easily read the text on the webpage?
- Do you feel as though the system is too slow?
- Are there any parts of navigating the site that confuse you?
- If there is anything you could change about the website, what is it?

- Do you know what the x page does (use UI pages in scope)?
- How long did it take you to get used to the site?
- Is making a childcare booking easy or difficult?

*Internal Warehouse User Acceptance Testing*

To accurately identify the benefits that the warehouse staff are experiencing, a survey will be distributed to the current employees to be quickly filled out on-company time in a lull in work. Questions related to the Fee and Inventory Combined Solution will consist of:

Usability Acceptance Questionnaire for Inventory Management Section of Fee and Inventory Combined Solution				
Criteria		Rank (Please Provide a rank scale from 1-3 for each criteria)		
		High	Moderate	Low
Visibility	Have the colours been used effectively?			
	How user friendly is the font size used?			
	How user friendly is the font type used?			
Performance	To what level does the system meet your requirements?			
	To what level does the system meet the efficiency?			
	To what extent does the system provide the expected outcome?			
	To what extent does the security reach your expectation?			
	To what level does the system developed satisfy you?			
Navigability	To what level Does the system provide you clear accessibility to other pages from the home page?			
Consistency	How consistent is the usage of font size, types and colours?			
	How consistent is the design and layout?			
Functionality	Clear labelling of functions			
	Ability of beginners as well as expert level users			
	Availability of required functions			
	Are messages clear on their meaning?			
	Are errors clear in what went wrong and how the issue can be resolved?			

*Requirement Walk Through*

A requirements walk-through will need to be conducted before the Fee and Inventory Combined Solution is deployed. This walk-through will consist of stepping through each of the components that are in the “Allocate Requirements” section of the report, checking that each business need, stakeholder requirements, functional requirements and non-functional requirements have all been soundly implemented. This will be performed in a virtual group call setting with a demo deployed of the current state of the Fee and Inventory Combined Solution that is accessible to the Board, IT payment clerks, payment clerks and purchasing officer.

*Site Metrics*

To track the KPIs the solution will have extensive usage statistics and product statistics information. Each time a payment clerk searches this will be tracked to be able to track the amount of time it is taking between searching, performing the desired actions, and exiting the parents’ account. Searches with accounts found that do not lead to any actions will be seen as ‘stopped’ purchase. The amount of time that each product is selected, view time on it, time spent in cart, times purchased and in what amount will also be tracked. This is so that estimations can be made about the popularity, presentation, and pricing of products. The number of children at what times in the childcare drop-off service will be available to the public, but also aggregated to be viewable with trends over time such as the most popular times that bookings are made, when bookings are made in relation to how full the service is, how long bookings are for and the relation of when a child is dropped off and picked up versus the scheduled booking time. For the inventory management, each part of the process will be tracked, with how long external orders take, the purchase orders from parents to item

retrieval and delivery, statistics surrounding which items are most requested by staff and in relation, what items keep going out of stock or are requested yet are not provided.

### 3.3.4 Costs Analysis-Estimation

There are two sets of costs for the Fee and Inventory Combined Solution. The initial cost which is the setup for the solution, as well as continuing costs which will apply each year after the solution has been implemented.

#### Initial Cost

Departments	#	Cost/Salaries	References/ Assumption
<b>ScienceSoft</b>		<b>Total Cost</b>	
1) Inventory Management System Quote	1	\$129,159	(ScienceSoft, 2022a)
2) Fee Payment Web Portal Quote	1	\$129,159	(ScienceSoft, 2022c)
<b>IT Payment Clerks Team</b>		<b>Total Cost</b>	
1) Hiring (\$5500pp)	3	\$16,500	Assume 50% Staff Loss. (Haycock, 2022)
2) Training	5	\$2,871	(ScienceSoft, 2022b)
3) Computers	5	\$5,000	(ScienceSoft, 2022b)
4) Network Infrastructure	1	\$850	(MrTelco, 2022)
5) Phones (\$100p + \$5000 setup)	5+1	\$5,500	(Connexus, 2022)
6) Rental Finding Costs (\$27/hr)	1	\$2,500	2 Weeks of Management Wage (Payscale, 2022)
<b>Counter Payment Clerks</b>		<b>Total Cost</b>	
1) Hiring (\$5500pp)	3	\$16,500	Assume 50% Staff Loss. (Haycock, 2022)
2) Training	5	\$2,871	(ScienceSoft, 2022b)
3) Computers (\$1000p)	5	\$5,000	(ScienceSoft, 2022b)
4) Network Infrastructure (\$850p)	5	\$850	(MrTelco, 2022)
5) Phones (\$100p)	5	\$500	(Connexus, 2022)
<b>Board</b>			
1) Computers	10	\$10,000	(ScienceSoft, 2022b)
2) Network Infrastructure	1	\$850	(MrTelco, 2022)
<b>Inventory Store</b>		<b>Cost/Annum</b>	<b>Cost/Annum</b>
2) Training	1	\$2,871	(ScienceSoft, 2022b)
3) Computer + Scanner (\$1000p)	1	\$1,000	(ScienceSoft, 2022b)
4) Network Infrastructure (\$850p)	1	\$850	(MrTelco, 2022)
<b>Table 1: Cost Data</b>		<b>\$332,831</b>	<b>Initial Cost</b>

There are a lot of assumptions that go into cost-analysis. Each of the costs is referenced and it is assumed that the prices and estimates put forward by these suppliers and price estimation services are correct. Due to this a +- 20% either side of the cost should be expected. It was also assumed that there would be no infrastructure to support the new system and it would all need to be implemented and installed. It is assumed that there is no space at the head office for the IT Payment Clerks and thus they would need to have extra space rented for them.

#### Continued Costs

Departments	#	Cost/Salaries	References
<b>ScienceSoft</b>		<b>Yearly</b>	
1) IT Support Team (\$18 per ticket)	1	\$6,570	1 IT specific ticket per day (ScienceSoft, 2022d)
2) Server Maintenance (\$2000 month)	1	\$24,000	(ScienceSoft, 2022e)
3) Further Updates	1	\$1,000	(ScienceSoft, 2022e)
<b>IT Payment Clerks</b>		<b>Yearly</b>	
1) IT Payment Clerks Wages (65K-60K)	5	\$5,000	Wage increase since they are existing staff (Payscale, 2022b)
2) Internet	1	\$200	(NewDaily, 2020)
3) Electricity (\$4000 for 5 People)	1	\$4,000	(Wrigley, 2021)
4) Rent	1	\$20,000	(CommercialRealEstate, 2022)
5) Utilities	1	\$2,400	(CommercialRealEstate, 2022)
6) Maintenance	1	\$2,400	(CommercialRealEstate, 2022)
<b>Counter Payment Clerks</b>		<b>Total Cost</b>	
1) Payment Clerks Wages (60K-60K)	5	\$0	No Wage Increase
2) Internet	5	\$1,000	(NewDaily, 2020)
3) Electricity (\$4000 for 5 People)	5	\$4,000	(Wrigley, 2021)
3) Further Training	1	\$560	(ScienceSoft, 2022b)
<b>Board</b>			
2) Internet	2	\$400	(NewDaily, 2020)
3) Electricity (\$4000 for 5 People)	10	\$8,000	(Wrigley, 2021)
<b>Inventory Store</b>		<b>Cost/Annum</b>	<b>Cost/Annum</b>

2) Internet	1	\$200	(NewDaily, 2020)
3) Electricity (\$4000 for 5 People)	1	\$800	(Wrigley, 2021)
Table 2: Cost Data		\$80,530	Continued Costs

There are a lot of assumptions in the continued costs analysis. It is assumed that the referenced prices are correct and that the quantity assigned to them is also correct. Again, it is assumed that the new setup infrastructure will need to be paid for and maintained which is included in this project cost.

### 3.3.5 Costs Benefit Analysis

#### Payback Period (PBP)

The payback period is the amount of time the business would need to see that the initial cost invested into a project is returned in terms of value. For the Fee and Inventory Combined Solution this was only 34 months or 2.8 years. This is a reasonable payback period and will allow Little Stars to quickly recuperate their investment.

Payback Period	Annual Net Cash Flows	Cum. Annual Benefit
Year 1	(\$332,831.00)	(\$332,831.00)
Year 2	\$159,470.00	(\$173,361.00)
Year 3	\$207,470.00	\$34,109.00
Year 4	\$207,470.00	\$241,579.00
PBP:	34.02714609	Months
	2.835595508	Years

#### Return on Investment (ROI)

The ROI is the percentage return on the initial investment. It is an assumption that the new system will last 5 years before needing to be significantly overhauled and thus no longer produce any cash flow. 5 years was chosen as this is often the amount of time it takes for website designs to look old and is often how long it takes for web development stacks such as PHP or React to completely overhaul themselves and make code become “legacy”, meaning that the codebase should be updated. This isn’t to say that this is a definitive line in the sand where the solution will break, but it is a long enough time to get reasonable returns from (Matt, 2018).

$$\text{ROI: } 135\% = ((\$159,470 + (3 \text{ years} \times \$207,470)) - \$332,831.00) / \$332,831.00$$

The return on investment is then 27% for 5 years.

#### Net Present Value (NPV)

The net present value is the expected future benefits expressed in the value of those benefits at the time of investment. Yet again it is assumed that the solution will be working for at least 5 years before a major overhaul is needed.

Present Value		15%	(AustralianRateInflation, 2022)	Inflation + 10% Growth
Year	Cash Flow	Rate	PVF = 1/(1+r)^n	PV = (PVF x CF)
1	\$0.00	15.00%	0.869565217	\$0.00
2	\$159,470.00	15.00%	0.756143667	\$120,582.23
3	\$207,470.00	15.00%	0.657516232	\$136,414.89
4	\$207,470.00	15.00%	0.571753246	\$118,621.65
5	\$207,470.00	15.00%	0.497176735	\$103,149.26
			Sum of PV =	\$478,768.03
			Initial Cost	(\$332,831.00)
			NPV	\$145,937.03

It was assumed the rate was 15% as the current inflation rate is 5% and Little Stars will most likely find that 10% is a acceptable growth rate. 15% also happens to be around the interest rate on business loans meaning if Little Star were to get a loan to implement this new system, the benefits that are generated would exceed the cost of the loan and they

would be able to repay it (Moula, 2021). As seen, the NPV was \$145,937 which means that currently, the Fee and Inventory Combined Solution is a worthwhile investment that has value.

#### Internal Rate of Return (IRR)

The internal rate of return is the rate on an investment for the NPV to become 0. A larger IRR is better than a lower one and dictates what a loan interest rate would need to be for the investment to become not worth while.

Year	Cash Flow	Rate	PVF = $1/(1+r)^n$	PV = (PVF x CF)
1	\$0.00	28.00%	0.78	\$0.00
2	\$159,470.00	28.00%	0.61	\$97,332.76
3	\$207,470.00	28.00%	0.48	\$98,929.41
4	\$207,470.00	28.00%	0.37	\$77,288.60
5	\$207,470.00	28.00%	0.29	\$60,381.72
			Sum of PV =	\$333,932.48
			Initial Cost	(\$332,831.00)
			NPV	\$1,101.48

The rate of 28% still provides \$1101 of NPV

Year	Cash Flow	Rate	PVF = $1/(1+r)^n$	PV = (PVF x CF)
1	\$0.00	29.00%	0.775193798	\$0.00
2	\$159,470.00	29.00%	0.600925425	\$95,829.58
3	\$207,470.00	29.00%	0.465833663	\$96,646.51
4	\$207,470.00	29.00%	0.361111367	\$74,919.78
5	\$207,470.00	29.00%	0.279931292	\$58,077.35
			Sum of PV =	\$325,473.21
			Initial Cost	(\$332,831.00)
			NPV	(\$7,357.79)

The rate of 29% does not provide value to Little Stars thus the IRR is 28%

#### Risks

There are a variety of risks to the project. A lot of risks have been “assumed” to not impact the solution. The following risks may affect the solution

Risk ID	Description	Probability	Impact	Response Action
R1	Malicious attackers attempting to gain access to the solution by performing MITM attack	Very Low	High	Have ScienceSoft use HTTPS and encryption on all sensitive data
R2	Malicious attackers attempting to shutdown the solution by performing a DDOS attack	Low	High	Have ScienceSoft use anti-DDOS measures that are included in their server support management
R3	Malicious attackers attempt to gain access to the site by stealing login information via a cross site scripting attack	Very Low	Medium	Have the computers that are given to staff only have access to the solution. Have ScienceSoft have a CSRF key in their website to prevent the attack
R4	The development team and testers missing possible test cases causing bugs that stop the site functioning properly	Medium	Medium	Perform a requirements walkthrough previous to release and have ScienceSoft perform system testing
R5	An extreme weather event causing damage to servers that shutdowns the solution	Very low	Medium	Confirm ScienceSoft have redundant servers in locations that are weatherproof
R6	Loss of payment services caused by an external payment provider such as a bank losing service	High	Low	Have multiple payment providers so that if one goes down payments can still be handled by other means

<b>R7</b>	Widespread disruption of the network causing IT payment clerks to be unable to answer calls	High	Very Low	Have a ticketing system so that if calls cannot get through than tickets will be stored and answered later
<b>R8</b>	Employees valuable to Little Star leaving due to the changes	High	Low	Have existing staff train new staff
<b>R9</b>	Missing features caused by a miscommunication with stakeholders and ScienceSoft	Medium	High	Have regular meetings setup between ScienceSoft and stakeholders, pre-done requirements such as in this document as well as a requirements walk-through before launch
<b>R10</b>	Employees of Little Star sabotaging the transition process due to them not liking their new job roles or what it entails	Low	Low	Have ScienceSoft and management ensure staff that the change will not remove any jobs and that have interviews done with multiple different employees
<b>R11</b>	Events at ScienceSoft or Little Star cause unforeseen project delays	Medium	Low	Delay the launch of the project till issues are fixed and apply surplus budget to bolster manpower to increase development time
<b>R12</b>	Time differences between ScienceSoft and Little Star cause communication issues preventing updates required by Little Star	Very Low	Low	Remind ScienceSoft of their contract and their guarantee to provide worldwide services of high quality that are being paid for by Little Star. Request a team that is dedicated to Australia time which what is promised
<b>R13</b>	The lack of information provided to the BA team meaning that assumptions made about Little Stars that are crucial for recommending solutions are wrong leading to a poor analysis	Medium	High	Have multiple well defined solutions that were not recommended that can be reanalysed and compared based on the new information Little Star gives in their rejection of the proposed solution

### 3.3.6 Summary

In summary, the business case for the Fee and Inventory Combined Solution is very sound. The solution provides a lot of benefits through increased revenue and both staff and parent satisfaction. The costs of the solution are under the required budget, with an ROI of 27% for 5 years, a payback period of 34 months and a net present value of \$145K assuming the solution lasts at least 5 years. The risks to the solution have already have been accounted for with a response action and thus the cost of the project should not exceed the analysed cost by so much as to make the business case unsound.



## 3.4 Allocate Requirements

### 3.4.1 Requirements

Combined and modified set of solution requirements for the Fee and Inventory Combined Solution

RID	Requirement
RE1	The Fee and Inventory Combined Solution must allow for the creation of parent accounts
RE2	The Fee and Inventory Combined Solution must allow for the payment of outstanding fees via an online portal accessible online
RE3	The Fee and Inventory Combined Solution must allow the purchasing of products
RE4	The Fee and Inventory Combined Solution should produce invoices for fee payments
RE5	The Fee and Inventory Combined Solution must allow for bookings to be made for the casual day care service via an online portal accessible online
RE6	The Fee and Inventory Combined Solution should allow for the changing of product costs
RE7	The Fee and Inventory Combined Solution could enable site usage information to be viewable
RE8	The Fee and Inventory Combined Solution could allow for integration with OCR or similar software to aid in data migration
RE9	The Fee and Inventory Combined Solution must meet corporation security standards such as SHA-256 encryption, HTTPS and hashing passwords
RE10	The Fee and Inventory Combined Solution must have a computer with website for each support technician or payment clerk
RE11	The Fee and Inventory Combined Solution must have a support team to contact for website queries or concerns
RE12	The Fee and Inventory Combined Solution must take no longer than 2 seconds for any internal database call
RE13	The Fee and Inventory Combined Solution could take a maximum of 30 seconds to have payment confirmed once payment has been provided
RE14	The Fee and Inventory Combined Solution could refresh all current sessions with new price information within 30 seconds of an update being made
RE15	The Fee and Inventory Combined Solution must take no longer than 5 seconds to search for a parent account
RE16	The Fee and Inventory Combined Solution could have support staff that are able to handle 2 external calls per hour
RE17	The Fee and Inventory Combined Solution could have support staff that are able to handle 1 internal email per hour
RE18	The Fee and Inventory Combined Solution must have inventory request forms digitalized
RE19	The Fee and Inventory Combined Solution must allow for easier inventory request form approval in between each user
RE20	The Fee and Inventory Combined Solution allow for automatic stock level updates in the inventory list
RE21	The Fee and Inventory Combined Solution must allow for easier searching and ordering through the registered suppliers
RE22	The Fee and Inventory Combined Solution must allow for easier stock searching and checking
RE23	The Fee and Inventory Combined Solution must have a way to monitor the progress of a request
RE24	The Fee and Inventory Combined Solution must not allow staff to have the same level of access as purchasing officer
RE25	The Fee and Inventory Combined Solution must take no longer than 2 seconds for any internal database calls and updates
RE26	The Fee and Inventory Combined Solution must take no longer than 10 seconds to search for any stock availability from any of the registered suppliers



### 3.4.2 Deliverables

New deliverables for the combined solution

DID	DELIVERABLE	CID	COMPONENT
D1	Fee and Inventory Combined Solution Backend	C1	Database
		C2	Database Request API
		C3	Backup Systems
		C3	Code maintenance
		C6	Account Creation & Login Page
D2	Fee Payment Web Portal	C7	Product Analytics Page
		C8	Products Edit Page
		C9	Products Page
		C10	Payment Page
		C11	Account Search Page
		C12	Outstanding Fees Page
		C13	Childcare Bookings Page
D3	Inventory Management Software	C14	Barcode Scanning System
		C15	Real Time Inventory Updating System
		C16	Purchase Order Management
		C17	Inventory Analytics and Reports
		C18	Warehouse Stock Management
		C19	Order Management
D4	Hardware	C20	Purchase Management
		C21	Network
		C22	Computers
D5	Training	C23	Servers
		C24	Train staff to use system
D6	IT Support	C25	Provide Documentation for Parents
		C26	Internal External requests/calls/emails
D7	Data Migration	C27	External requests/calls/emails
		C28	Receipt, Payment, Inventory Forms Migration
D8	Future Changes	C29	Changes to the system to meet new demands

### 3.4.3 Business Needs

The business needs in tabular form with IDs

BID	Business Need
B1	Reduce the average wait time in payment line from 10 minutes to 1 minute within 6 months
B2	Reduce the time it takes for clerks to process a payment by 80% within 6 months
B3	Have a reduction of foot traffic at the payment counter down to at most 25 people per day within 6 months
B4	95% reduction in paper form usage company-wide within 2 years
B5	80% reduction in the turnaround time from form submission to approval within 6 months
B6	Increase the ratio of students to staff to 4:1 through the addition of new students to the centre within 5 years
B7	Produce reports on demand instead of monthly within 1 year
B8	80% reduction in time to fulfillment of stock requests within 1 year

### 3.4.4 Allocation

Deliverables, components and how they related to the requirements and business needs

DID	CID	COMPONENT	Requirement Set	Business Needs	Explanation
<b>D1</b>	<b>C1</b>	Database	RE9, RE12, RE13, RE14, RE15, RE25, RE26	B1, B2, B4, B5	The database itself is where the information will be stored. This reduces the time to access the information and reduces paper waste.
	<b>C2</b>	Database Request API	RE12, RE13, RE14, RE15, RE25, RE26	B1, B2, B4, B5	The database request API is the middle layer between the database and the software. A lot of latency will be due to how well it copes with requests.
	<b>C3</b>	Backup Systems	RE18, RE8, RE14, RE12, RE25, RE26	B1, B2, B4, B5	Backups allow the previously paper documents to be guaranteed to be kept. Also means that the uptime for the system will be higher, decreasing wait times.
	<b>C3</b>	Code maintenance	RE14, RE12, RE25, RE26	B1, B2	Code maintenance will mean the site continues to make requests with low latency
	<b>C6</b>	Account Creation & Login Page	RE1, RE9, RE24	B3, B4, B6	Account creation means that parents no longer have to visit the office and there is separation in functionalities between privileges.
<b>D2</b>	<b>C7</b>	Product Analytics Page	RE7	B7	Is able to provide usage information and produces the report instantly
	<b>C8</b>	Products Edit Page	RE6	B4, B3	Allowing prices to be edited online helps reduce paper waste and helps online ordering so people do not have to go to office
	<b>C9</b>	Products Page	RE3	B4, B3	Allowing products to be bought online helps reduce paper waste and means people do not have to go to the office
	<b>C10</b>	Payment Page	RE2, RE4	B2	Means that payments can be handled both online and really quickly at the office. Invoices will also be produced automatically speeding the process up further
	<b>C11</b>	Account Search Page	RE2, RE3, RE5	B2	With account searching the clerks can find a person and process their payments quicker
	<b>C12</b>	Outstanding Fees Page	RE2	B1, B2, B3	Having outstanding fees be payable through the page makes it quicker and allows people to do it outside the office
	<b>C13</b>	Childcare Bookings Page	RE5	B1, B3	Reduces foot traffic through the office and reduces wait times since bookings can be done online and don't need to paid straight away
<b>D3</b>	<b>C14</b>	Barcode Scanning System	RE18, RE19, RE20, RE22	B5, B7, B8	Allows items to be scanned thus can be tracked and handled quicker

	<b>C15</b>	Real Time Inventory Updating System	RE20, RE21, RE22	B7	Tracked stock and immediately have reports generated
	<b>C16</b>	Purchase Order Management	RE19, RE22, RE23, RE24	B4, B5	Managing purchase orders means that requests can be tracked and reduces the fulfillment time, and reduces paper waste
	<b>C17</b>	Inventory Analytics and Reports	RE20, RE22	B7	Easier to search stock, view and track interesting elements, with reports being generated instantly
	<b>C18</b>	Warehouse Stock Management	RE20, RE21, RE22	B4, B8	Allows suppliers to easily checked as well as stock, reducing paper waste and turnaround time.
	<b>C19</b>	Order Management	RE23, RE24	B4, B5	Allows orders to be viewed and tracked, reducing turnaround time and paper waste
	<b>C20</b>	Purchase Management	RE23	B8	Allows for easier stock tracking, reducing paper waste
<b>D4</b>	<b>C21</b>	Network	RE14, RE15, RE16, RE17, RE25, RE26	B1, B2, B3, B4, B6, B7, B8	Critical to the solution, helps also metric and timing based requirements and business needs
	<b>C22</b>	Computers	RE10, RE11, RE14, RE15, RE16, RE17, RE25, RE26	B1, B2, B3, B4, B6, B7, B8	Critical to the solution, helps also metric and timing based requirements and business needs. Also needed by all staff who interact with the system.
	<b>C23</b>	Servers	RE14, RE15, RE16, RE17, RE25, RE26	B1, B2, B3, B4, B6, B7, B8	Critical to the solution, hosts the system so without them no solution occurs. B6 is being included as if the solution wasn't to go forward more staff would be needed.
<b>D5</b>	<b>C24</b>	Train staff to use system	RE11, RE16, RE17	B2, B3, B5, B8	Level of staff training effects metric and timing needs, with the support requirements being related
	<b>C25</b>	Provide Documentation for Parents	RE16	B3	Providing documentation means less support tickets and less people in the office
<b>D6</b>	<b>C26</b>	Internal requests/calls/emails	RE17	B6	Having internal help for support means that efficiency is increased reducing staff need
	<b>C27</b>	External requests/calls/emails	RE16	B3	Providing support means less people in the office
<b>D7</b>	<b>C28</b>	Receipt, Payment, Inventory Forms Migration	RE8, RE18	B4	Transfer to paperless reduces paper usage
<b>D8</b>	<b>C29</b>	Changes to the system to meet new demands	RE12, RE13, RE14, RE25, RE26	B2, B5	Keeping system updated results in better response times

### 3.4.5 Summary

As demonstrated by the allocation diagram above, the deliverables that contain the components of the Fee and Payment Combined Solution are directly linked with the stakeholder requirements and the business needs. Each of the stakeholder requirements has at least one component that implements it, and all stakeholder requirements are satisfied by one or more components and requirements. Each link has a logical explanation explaining the link from the component clearly demonstrating why that component meets the business needs and the requirements. All the components that are to be implemented are thus needed in the solution, with no components that do not provide value to the business.

## 3.5 Organization Readiness

### 3.5.1 Cultural Assessment and Stakeholder Impact

#### *Affected External Stakeholders*

**Parents:** Parents will be positively affected by the change as they have had many complaints in the past about the current system, its waiting times and large amounts of paperwork. They fully understand why the solution is required and want the change to be successful. The features of the fee payment part of the solution are directly tailored towards this group. Some may be resistance to the change, especially those not well versed with technology, but the office will still be open, serving parents quicker than before. Overall, this group is ready for the change and will be impacted positively.

**Other Childcare Facilities:** Competitors of Little Stars will be negatively affected and do not want the change to be successful. They are businesses and while some may be friendly, they are competing, and would wish that they had a better service. They probably do understand why the solution is required, as Little Stars growth may not have been as quick as their own if they already have modernized and gotten rid of paper-based processes.

**Childcare Legislators & Inspectors:** Childcare legislators want the change to be successful but will be keeping an oversight on the project through occasional audits and investigations. They may be stubborn or fluid depending on the team and depending on the day. They probably do not understand why the solution is required but will be informed upon questioning. As change makes their lives harder, they may be resistant and the solution will need to bend to their wills for it to be implemented.

**Suppliers:** Suppliers will want the change to be successful as they can integrate their supply chains into the solution and receive even more profits by supplying the goods that Little Star uses and resells. As a business they will be driven by profit, and not having to deal with Little Stars outdated system will make them more profitable. Individual workers may feel the increase in workload annoying, but this is more of a lack of staff problem due to increasing supply demands. Previous suppliers will understand why the solution is needed after having dealt with the paper system beforehand but new suppliers joining while the launch occurs may not and nitpick the new system. Overall, this stakeholder group will be accepting of the changes and is ready.

#### *Organization*

**CEO/Board:** The board wants this change to be successful as they are the ones who have hired the BA team to sort through the problem with the organisation and present solutions. The CEO feels strongly about their company and wants it to improve. As the CBA showed, this will be a positive solution for the company, generating a lot of value and thus the rest of the board will also be accepting. The large upfront cost may be a little discouraging, but the current systems are so bad that the entire board knows why the solution is required and will spend the money if a positive NPV is promised, which it is. This stakeholder group will be accepting and help in the solution.

**Operations Manager:** The operations managers day to day job will be affected as they are responsible for greenlighting the suppliers and will need to be trained to use the new system. From the interviews it is believed that the operations manager does want the change to be successful as dealing with the current paper-based system is cumbersome. The operations manager is willing to be taught how to use the new system as long as it does not affect his job security. Reassurance will need to be made that they will keep their job and it will not be automated. Overall, this stakeholder will be receptive of the change as long as it is handled respectfully

#### *Affected Organisational Unit*

**Teachers/Carers:** Teachers and carers are affected as they will be interacting and ordering items daily from the system and have these items in their classes. The current system is extremely painful to deal with, with complaints being heard from these teachers unable to get the items they need into their classrooms for their students and for themselves. The upgrade will enhance their teaching experience and make it so that classes will be able to function properly and not have large issues dealing with missing items needed for lessons. The teachers have wanted this change, understand why it is required and desperately want it to succeed. This stakeholder group is eager for the solution to proceed.

**Payment Staff:** The payment staff will be the most affected group out of any of the organizational unit. The payment clerks will have the option of staying at their current posts and being upskilled or moving to the central IT support center for payment clerks, which will mean different hours, a different commute and a slightly different job. As the payment clerks have been strictly payment based it is expected that at least half of the payments clerks will be resistant, which is what the CBA accounted for. While the group does want the change to be successful in terms of processing times and being able to deal with customers easily, having the system also be able to be used by customers may feel threatening to them as their job will be mostly being done by the solution. The payment clerks understand why the solution is required as they deal with the consequences of the old system as their job. Overall, this stakeholder group will be the most resistant to the change, but understand why it is needed on a business level and at least some will agree to help.

**HR Officer:** The HR officer may be upset that their own process will not be changing, but the inventory management system will improve the speed they receive their stationary and thus will not get in the way.

**Purchasing Officer:** The purchasing officer will be the second most affected out of the organization. They will need to be retrained with the new system but overall, they will continue to be doing the same job, checking on inventory, and making sure stock levels are up-to-date. The new system will streamline their job making it a lot easier. The purchasing officer understands why the change is occurring as the current system is slow and makes the purchasing officers job a nightmare. Overall, the stakeholder will want the change to be successful as it streamlines their job, without the job role changing at all, thus they should be helpful in its implementation.

#### *Solution Delivery*

**Business Analyst Team:** On behalf of the BA team, with the amount of work that we have put into this solution assessment it would be devastating for it not to be implemented. We are fully on-board and want the solution to go-ahead.

**Software Developers:** The software developers at ScienceSoft will be paid handsomely to implement the system. As it is their job for the solution to be implemented, they will want the change to be successful, as it looks bad on their reputation if the solution fails. After 33 years in the industry and having worked with partners such as eBay, ScienceSoft have proven to be hard workers that are able to deliver great solutions while being friendly and happy with clients. They will understand why the solution is required through the discovery and design phases, as well as their own analysis of this document.

#### 3.5.2 Operational Assessment

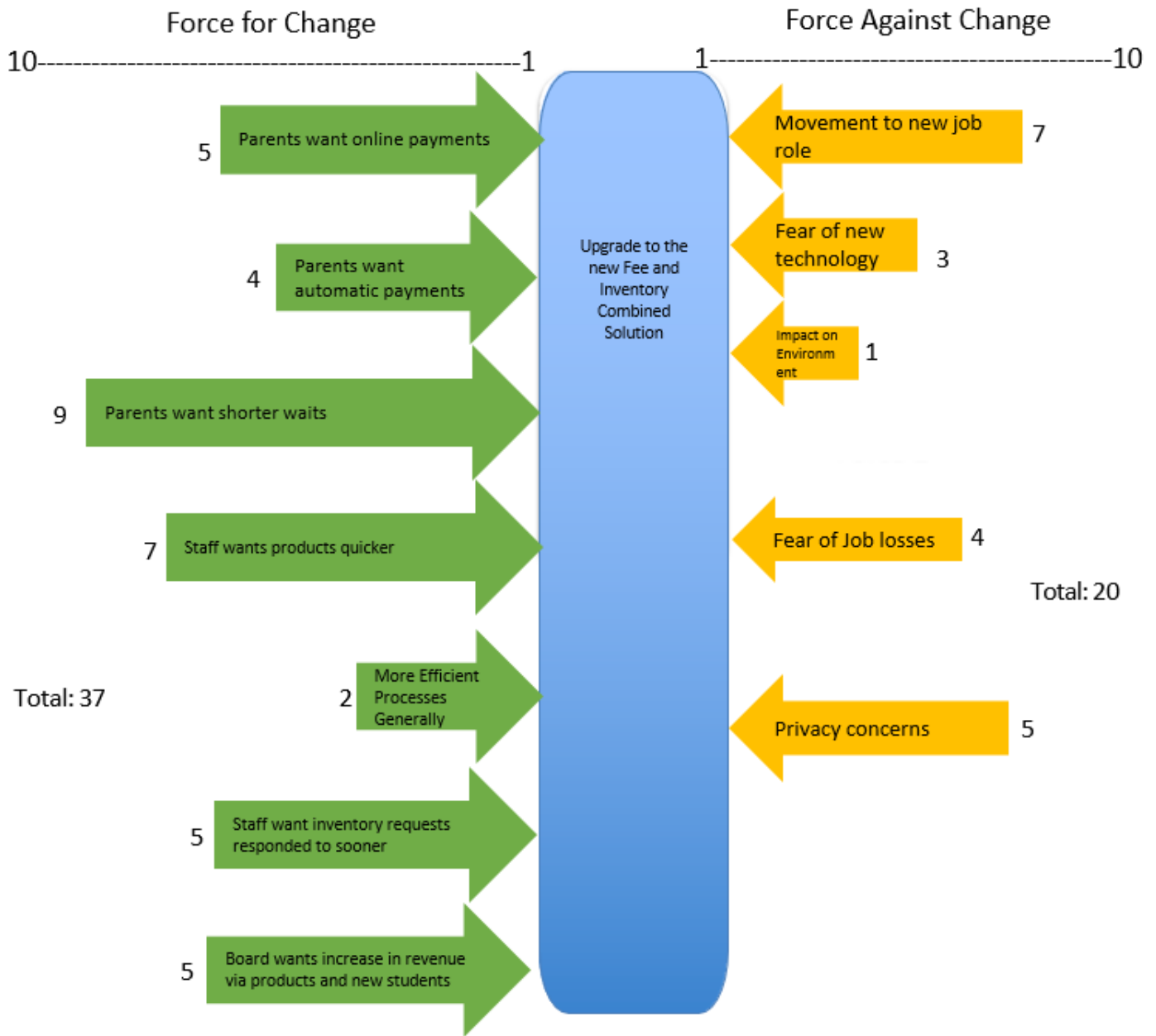
Currently, the organization is in a mediocre position to take advantage of the capabilities of the solution. As shown in the CBA, a lot of network and computer infrastructure will need to be put in place for the solution to be utilized, and thus are included in the solution implementation components. Training has been organized by ScienceSoft to be conducted once the solution has been built. Currently, policies and procedures will need to be created in reference to the appropriate use of computers such as basic security procedures such as not sharing passwords and plugging in random USBs. Again, ScienceSoft can provide these procedures and will be requested to do so. As ScienceSoft is a well-known company the solution will be able to perform at the required level set out by the non-functional criteria. Support mechanisms for the solution are built into the solution approach such as the implementation of the IT payment clerks, the internal IT support from ScienceSoft, as well as the training and documentation that will be provided.

To have all the stakeholders be involved in the creation of the solution will be difficult to do in the way that ScienceSoft is used to conducting design discussions. As there is little to no evidence that anyone but the board is modernized, the methods in assignment 1 involving direct communication between the BA and stakeholders will need to occur. As there are 5 different locations this makes it difficult but the BA team has put in the effort and already retrieved the stakeholder requirements. The board, BAs and ScienceSoft will make frequent virtual meetings to check on the progress of development. Once the computers and networking is installed at each location, appropriate stakeholders such as the IT payment clerks will be able to join in on these meetings if needed or requested.

Current Organizational State

	Major Barrier	Substantial Barrier	Significant Changes Needed	Minimal Changes Needed	Full Support
Align with Org Goals & Objectives				X	
Align with Org Values & Culture				X	
Resource Availability					X
Sponsor Interest					X
General Support				X	
Stakeholder Perceptions					
Stakeholder Education			X		
Internal Factors (skills, strengths, weaknesses)			X		
External Factors (opportunities, challenges)				X	

### 3.5.3 Force-Field Diagram



### 3.5.5 Summary

As can be seen in the force-field diagram, the force for change at Little Stars is overwhelming compared to the forces against change. The solution will modernize Little Stars fee and inventory processes, increasing efficiency in inventory requests and inventory fulfillment and slashing the wait times at the office, providing parents other means of paying fees and purchasing products. It will impact the other processes at Little Star by increasing child numbers, keeping staff numbers the same and increasing revenue for the company in general. The impact will be a net positive and has majority support. Key supporters such as the payment clerks will be the group to put up the most resistance as their job will change significantly. Clear communication throughout the entire process will need to be given on what the changes are in the solution and their impacts. Payment clerks will need to be given both written, verbal and digital communications explaining what their job will entail so that they may decide as early on as possible to leave, so that new staff that will accept the changed positions can be trained. Overall, the solution has major support and will impact nearly all stakeholders positively.



### 3.6 Transition Requirements

Transitioning from one system or process to another can be difficult and time consuming. This is a result of multiple factors such as:

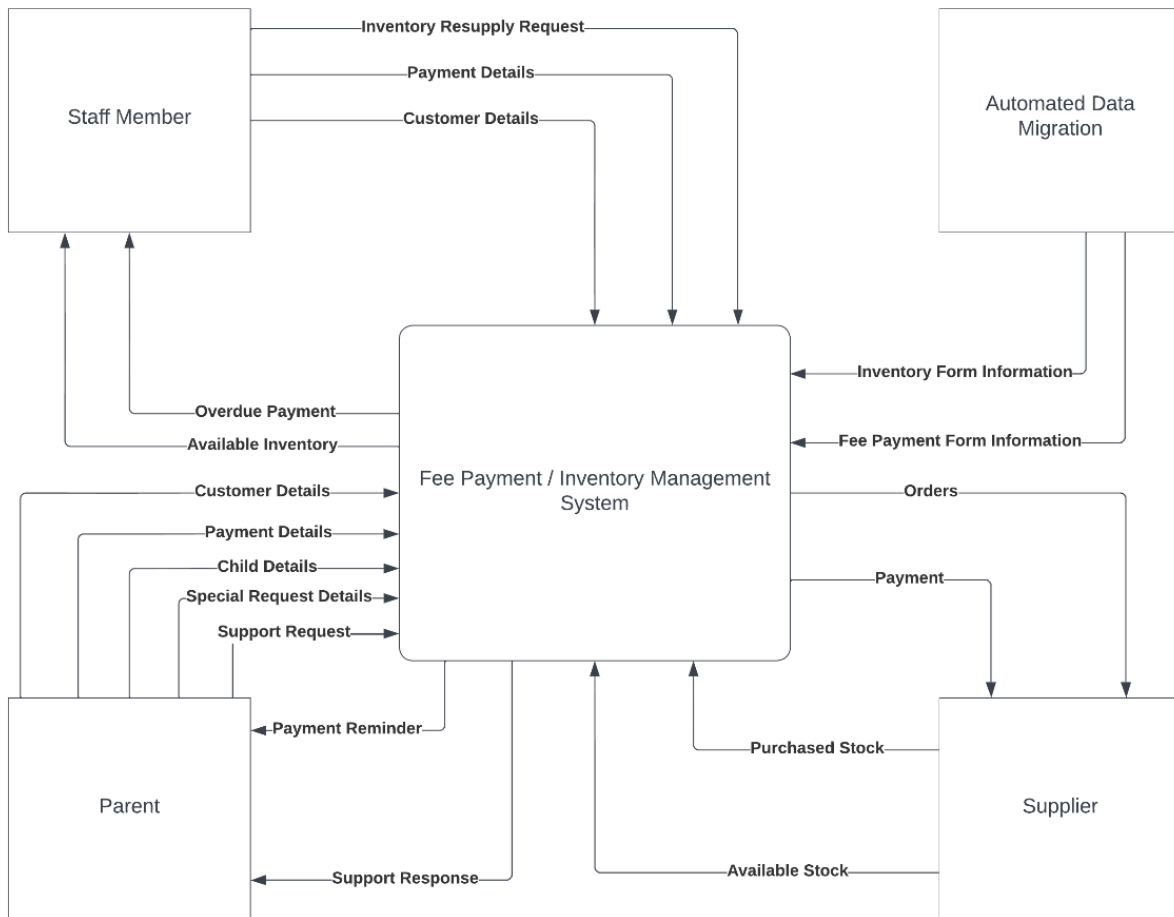
- Data having to be identified for archiving or transfer, and cleansing
- Business Rules being checked to see that the data is correctly converted and interpreted by the new system
- Cutover strategies put in place
- Creating and Implementing Training Documentation

#### Data

Existing data will need to be identified either for archiving or transfer. Once data has been identified it will need to be split into two groups. Master data will be comprised of User, Parent, Product, and Supplier Data. Transactional data will consist of transactions made by those parties such as inventory orders and fee payments.

Due to the integrity of the design master data will need to be loaded and verified before the transactional data can be loaded. Transferring transactional data will be done by cleansing forms to make sure that the data is sanitary before being fed to an Automated Data Migration system that will use optical character recognition to upload the data to the new system.

#### Data Flow Diagram



The above data flow diagram shows how data will flow in and out of the new Fee Payment and Inventory Management System.

## On-going work

A cutover document will be created to keep track of the steps required to deploy the new system successfully this will include information such as:

- Go-Live Date
- Final Go-Live sign off approval
- Steps that need to be done before deployment
- Steps that need to be done post deployment
- Data load steps
- System configuration information
- Release Lead
- Issue Escalation
- Emergency Contact Information
- Issue Management
- Training Documentation approval and distribution
- Deployment Window
- Backout approach

This information will be the foundation for the system's deployment. It is required as deployment involves numerous people each performing different tasks that can be difficult to track. Immediately after the release a post-implementation review will be held to discuss any issues that occurred and how they can be prevented in the future and how future releases can be better run.

Once the system is live Issues may arise from the new system an issues register will be created which will be used to track known issues and workarounds to them. During project implementation the new and old system may need to run in parallel for a short period of time. If this occurs any transactions that occur using the old process will need to be tracked and transferred to the new system when appropriate.

## Organizational Roles

The below stakeholders will be affected by the transition to the new system and will need to be alerted and consulted about the new system.

### *Project Manager*

- Plans and coordinates the resources and work for the transition
- Manages the transition phase

### *Childcare Legislator and Inspectors*

- Will provide the rules and standards for the development of the solution
- Checks compliance and oversees the transition of solution such as the recording of activities

### *Tester*

- Verifies that the transition has been performed correctly
- Create test plans to test the new system against the functional requirements

### *Sponsor*

- Informed of the effects of the new system as well as the associated costs and benefits
- Provides the capital for the transition to take place

### *Purchasing Officer*

- Provide details and information about the current process and its workflows

- Will receive training prior to the go-live date and the processes that the new system is capable of handling
- Provide information about the manual and paper-based tasks.
- Provide details and validations about transition agreement

#### *Operations Manager*

- Will inform registered suppliers about the ongoing change and implementation of the new solution
- Will receive training prior to the go-live date and the processes that the new system is capable of handling

#### *Payment Clerk*

- Will receive training prior to the go-live date and the processes that the new system is capable of handling

#### *Teaching Staff*

- Will receive training prior to the go-live date and the processes that the new system is capable of handling
- Will provide information about manual and paper-based tasks

#### *Parents*

- Will be notified of when the change will be live along with a guide on how to use the new system

#### *Implementation SME*

- Source for transition requirements

#### *Domain SME*

- Provides information on existing solutions and assists in the verification and validation of the transition requirements

## 4. Conclusion

In summary, after extensive examination and analysis of multiple different solution approaches, it has been concluded that the Fee and Inventory Combined Solution is the most viable and most beneficial solution approach that fully captures and addresses all of the business needs and requirements that has been outlined by Little Stars. It has been discovered that this solution approach is scalable and sustainable enough in order to support Little Stars future technological improvements, as well as future additional requirements and evolution which ultimately allowed the solution to be of extreme value for Little Stars.

This report included a detailed analysis and evaluation of the solution approaches for the fee payment, leave management, and inventory management process. A solution assessment was then conducted which evaluated each solution approaches feasibility and recommended the solution approach that is the most viable for each process.

After finding the most feasible solution approach for the fee payment, inventory management and leave management processes, a comprehensive solution assessment was then executed which allowed the business analyst team to come into a conclusion that the Fee and Inventory Combined Solution was the best approach for Little Stars. The solution assessment encompassed the scope of the solution which detailed the capabilities, components and functionalities that will complement the business needs and requirements of Little Stars. The Fee and

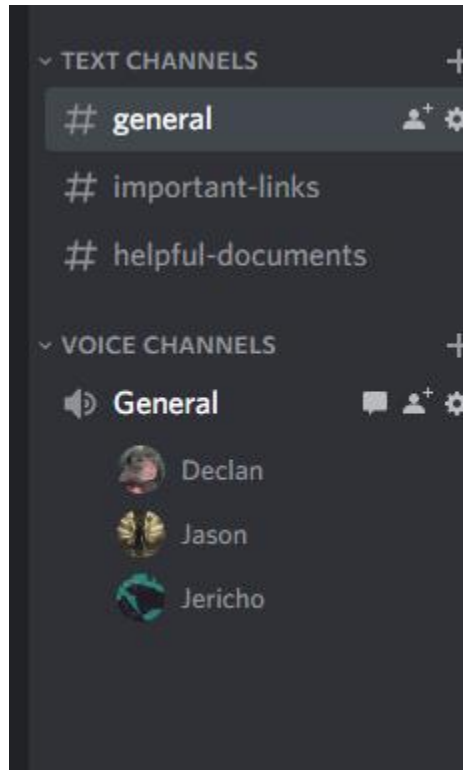
An extensive business case was also produced as part of the solution assessment which detailed the tangible and intangible benefits, costs, and the risk involved with the Fee and Inventory Combined Solution. The business case also included a detailed cost benefit analysis which further gave insight regarding the associated costs and the expected benefits for the solution.

Finally, requirements allocation was done in order to trace each component of the Fee and Inventory Combined Solution back to the provided functional and non-functional requirements based on the business goals and objectives that Little Stars has provided. Organizational readiness assessment and the transitional requirements has also been developed.

The Business Analyst team is confident that the recommended Fee and Inventory Combined Solution will bring outstanding results and improvements within Little Stars based on the results that has been gained after conducting the aforementioned analysis and assessment techniques in this report.

## 5. Appendix

Evidence of group work



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