



Wheel Chair Manufacturing Business Plan

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1. Executive Summary

1.1. Company Profile

Company: ACME (Making Life Easy)

Mission: ACME's vision is to integrate technical experience and manufacturing techniques with Nursing and allied health practices to design and manufacture innovative products that will improve the lives of the sick, disabled, carers and nurses.

ACME's Journey of Discovery:

ACME's Initial business plan "Innovative chairs" was inspired by a team member that was in the winning team of the International Integrated Manufacturing Challenge in which they had to design and build the cheapest electric wheelchair that satisfied the 24 competition specifications.

Market and industry research led ACME to the Aids & Equipment Program (A&EP). This is a Victorian Government program which aims to assist children and adults to access subsidised aids, equipment and home modifications to enhance their safety and independence, support their family and carers and prevent premature admission to institutional care or high cost services.

All equipment purchased by patients, is assessed by, either an Occupational Therapist (OT) or Physiotherapist (PT). These funds are allocated to 14 Metropolitan and 14 Rural A&EP service providers within Victoria.

Service providers are given a fixed expenditure limit annually and must manage the money to aid as many patients as possible.

There are 15 products on the subsidiary list and in surveying OT's and PT's ACME found there is a definite need for innovative designs in a large range of existing disability aids, carer aids and Nursing aids. The questionnaire also verified that lower cost products would enable more people to receive the benefits from the government fund.

ACME also identified through surveys, questionnaires and industry research that there is a lack in engineering development of new nursing and carer aids. Unlike the manufacturing industry, nursing and care is a medically educated dominated environment, as its primary focus is patient care and as a result has suffered from lack of innovation and engineering development within the field.

Our Objective:

ACME plans to take skills acquired in the manufacturing industry and implement them into the medical industry.

Overall this inspired ACME a company that will provide a large range of products and services that will bring improved lifestyles to their customers.

Our Approach:

ACME recognises that the key to successful innovation is with the professionals that work within the systems every day. These people are Occupational Therapists (OT), Physio Therapists (PT) and nurses. ACME extracts this valuable information via questionnaires and surveys. In the future ACME would like to further develop this useful tool by conducting Continuous Improvement workshops within specific areas of hospitals as understanding customer needs is vital in designing successful products and services.

1.2. Products and services

ACME initially intended to manufacture for the electric wheelchair market only. Extensive market research and investigations have enlightened ACME and demonstrated that sustained growth could not be achieved with this product alone. ACME has identified that the end users of ACME products are not our direct customers. Our customers are A&EP, OT's, PT's, Hospitals, distributors and a small amount of direct sales to end users.

ACME has further identified an opportunity for new innovation and improved products and services in the following areas:

Flexichair - basic foldable electric wheelchairs (Bottom end model)

Advantages:

- Competitor chairs do not meet ergonomic lifting standards
- Flexichair breaks down into 5 pieces each weighing less than 10kg
- Reduced supply lead time to local market
- More competitive pricing

Elitechair - (Top end model)

- Low cost and new seating pressure point shifting system

Wheel chair maintenance and second hand electric wheel chair recycling

- Develop government certified training program and become service agent.

Innovative new nursing and carer aids eg. (Bedsafe) protective bed rails, patient lifting equipment, portable baths, telescopic drip stands, patient locker transportation improvement, system integration, intelligent braking systems and monkey bars.

Bedsafe is designed to enclose bed rails on hospital beds, to remove the possibility of trapping limbs between the retractable structure and the mattress. A common injury accidentally caused to hospital patients.

Advantages:

- Totally new innovative products
- No existing competition
- Establish government and hospital contacts
- Ongoing questioning and research and development work with Occupational Therapists (key resource)

Hospital systems and equipment engineering consulting

1.3. Launch Strategy

ACME will first enter the market with the Bedsafe and Flexichair products. These products have been identified using the Porter 5 forces model as low and medium risk entry.

Products and Profitability:

Flexichair Components

Refer to section 6

Total costs including fixed costs	\$2332.00
Sales price	\$3350
Profit Margin	43.6%
Sales forecast	107
Profit	\$91,806

Bedsafe components:

Total Cost	\$39.50
Profit margin	20%
Development	20%
Sales price	\$55.30
Sales forecast (from section 3.3)	23.600
Development revenue	\$186,440
Profit	\$186,440

2. ACME Industry Prospects

ACME (Making Life Easy) will provide a large innovative range of products and services that will bring improved lifestyles for people with disabilities and people within the hospital and medical field.

From market research ACME have identified the following products that fit within existing manufacturing experience:

- “Flexichair” basic foldable electric wheelchairs (Bottom end model)
- “Elitechair” electric wheelchairs for wheelchair bound patients (Top end model)
- Wheelchair maintenance and second hand electric wheelchair recycling
- Innovative new nursing and carer aids eg. (Bedsafe) protective bed rails and patient lifting equipment
- Hospital systems and equipment engineering consulting

2.1. Current Industry Trends

The following is a summary of researched data discovered with regards to the industry:

- Established electric wheelchair imports
- 2 small interstate Australian electric wheelchair manufacturers
- Approx. 13 distribution centres in Victoria
- ACME can operate with improved methods and lower costs.
- Electric wheelchair industry mature, static product range and not responsive
- An identified lack of engineering development in nursing and carer aids
- Opportunities exist for many new innovative products
- Pricing is influenced heavily by the Victorian Aids and Equipment Program

2.2. How Will Competitors React?

Results from Questionnaires all indicate that distributors are supportive of Sales for ACME products. The ACME proposal will offer distributors reduced lead times and improved product services. Interstate competitors may react by reducing their product costs however still remain at a disadvantage due to logistics costs.

2.3. Who are ACME’s Customers?

Industry research has clearly indicated that end users are not the main ACME customers. ACME customers are mostly hospitals, distributors, OT’s and PT’s as they act as the interface between ACME and the end user.

As ACME is not primarily selling to the end user, mass marketing eg. Advertising in newspapers and television is not part of the ACME strategy. ACME strength in the market will be by establishing good hospitals, distributors, OT and PT awareness and communication. End users will only be a small part of sales.

A key factor, in the success of future innovative designs is that ACME must build a strong relationship with OT's and PT's. This is clearly shown in the ACME Electric Wheelchair Supplier Competitor Buyer Analysis (Figure 7).

2.4. Flexichair Electric Wheelchairs

Flexichair is designed to be a lightweight, foldable electric wheelchair and its main competitive advantage is that it meets material handling ergonomic standards, stating that the maximum safe lifting load, for women, of 15kg. Currently all other portable electric wheelchairs on the market have not achieved this standard and industry research has demonstrated that the majority of carers and nurses are women.

This innovation will enable the wheelchair to be safely lifted and transported without special taxis or lifting equipment, as it can be easily separated into 5 pieces, none weighing more than 10kg each. These pieces consist of 2 batteries, 2 drive assemblies (wheels & motors) and the chair assembly (seat, chassis, front wheels and control system).



Picture 1

2.5. Elitechair Electric Wheelchairs

After much competitor product investigation ACME is confident that a new top end model chair can be designed with innovative new comfort systems that alleviate pressure sores to patients for a more competitive price than models currently on the market. Current models on the market only offer tilt and recline features. The Elitechair will also incorporate a cyclic air cushioning system currently in the development stage.

The ACME vision is to design a top end electric wheelchair that will meet or better the \$6000 government assistance grant. Currently all the competitors have failed to achieve this.

2.6. Wheel Chair Maintenance

ACME will endeavour to set-up a skilled and certified wheelchair maintenance service, which will provide maintenance support to wheelchair users directly in their Melbourne homes or place of breakdown. Rural areas will also be supported by nominated and accredited satellite maintenance centres or by couriering the wheelchair to the ACME service centre.

ACME will negotiate with government policy makers to develop a government subsidised maintenance system for rural electric wheelchair users.

Through market research, A&EP questionnaires and OT questionnaires ACME has identified the following issues with the current systems and service:

- Maintenance costs are over priced and under resourced (See Appendix 9.2 Q10)
- Service agents are generally unskilled and untrained.

A thesis conducted by Diana Rose, a 53-year-old with Multiple Sclerosis who graduated in New Castle University with a Master of Occupational Health and Safety, identified that a large need existed for accredited training and certification for people who repair the vehicles. Currently any unskilled person can perform maintenance on wheelchairs and is not required to have any qualifications to repair wheel chairs. This leaves users of the chairs totally vulnerable to unacceptable methods of service.

ACME will first develop local knowledge of wheel chair issues and maintenance techniques. Then using their maintenance experience gained through 13 years of manufacturing, ACME will propose a certified training program for government approval. Industry experience will help ACME in the development and implementation of a reliable customer orientated service contract. ACME will aspire to become the accredited maintenance training facility for Victoria.

2.7. Hospital Systems and Engineering Consulting

ACME has identified through surveys, questionnaires and industry research a lack in engineering development of nursing and carer aids. Unlike the manufacturing industry, the nursing and care environment is dominated by the medically educated, as it's primary focus is patient care. Manufacturing is an engineering dominated environment and therefore has excelled in innovation and efficiency by using tools such as:

- Continuous Improvement Programs (CIP)
- Lean Production Systems (LPS)
- 5S organisational methods
- Quick Change Over Engineering (QCOE)
- Innovative product design

- System simulation
- Reduced labour planning methods

ACME plans to take these skills acquired in the manufacturing industry and implement them into the medical industry.

2.8. Innovative New Nursing and Carer Aids

2.8.1. Bedsafe (Project 1)

Bedsafe is designed to enclose bed rails on hospital beds, to remove the possibility of trapping limbs between the retractable structure and the mattress. A common injury accidentally caused to hospital patients.

The bedsafe system is a cheap easily manufactured removable screen to suit any hospital bedrail. This low cost system can be easily fitted to a hospital bed within minutes and is not yet available on the market.

This device will also have a number of small storage pockets for medical and personal equipment. Eg syringe driver, tissues, books, glasses, etc. These would eliminate the need for the patient to have to reach out of the bed to their storage drawers and provide more local storage area for equipment.

As the bedsafe product is removable and constructed with durable, transparent, breathable material, it allows for easy cleaning, minimal hygiene issues and a long and reliable product life.

2.8.2. Projects Under Development

All of the following items have been identified as items that currently require development in the industry and have been verified as original ideas. Final designs and costs are currently under development.

2.8.2.1. Patient Lifting Equipment

Under a new “no lift” policy released by the Australian government, nurses are no longer able to claim for lifting injuries caused by moving patients. This recent change has developed an immense need for engineering development for patient lifting equipment. This product will reduce effort required to move patients. ACME plan to adapt a system already developed for the manufacturing industry to the requirements of nursing.

2.8.2.2. Portable Bath

A portable bath system, that acts as a trolley and a bath in one. A patient can be easily transferred from the bed onto the trolley. As the trolley can be adjusted to the same height as the hospital bed the patient can then be transferred from the bed to the trolley and then pushed to the bathroom. Once in the bathroom, the latex trolley platform converts into a

diaphragm by lowering the latex within the frame so it can be filled with water and act as a bath.

2.8.2.3. Telescopic drip stand

This drip stand would be attached to every bed and extended into use when required. The benefits are a reduced work time and improved equipment availability. They are often hard to locate using current nursing practices.

2.8.2.4. Patient Locker Transport Improvement

Patient lockers currently have undersized wheels, creating excessive loads and poor manoeuvrability when requiring movement. The new design would have larger sized wheel to reduce the load and brakes to prevent the locker from sliding away at rest.

2.8.2.5. System Integration

All equipment in the nursing rooms are supplied via different suppliers and are not designed to nest with each other as a complete package. For example, bed side table, hoists, beds and other pieces of non-general equipment. ACME will design a complete set of equipment that would be fully integrated thus improving system quality and reducing incidents and effort. These new systems are only marketable to new carer centres and hospital upgrades.

2.8.2.6. Intelligent Braking Systems

Currently all transportation equipment has swivel castors. These sometimes tend to turn under the equipment and prevent the operator from being able to reach the braking lever. The new design would provide a central braking systems, always accessible to the operator and easy to use to aid patients with disabilities such as arthritis.

2.8.2.7. Monkey Bars

This is a handle that a patient uses to adjust themselves in their bed. The common problem is that this becomes an obstruction in standard nursing practices. The new design would be improved by making this a height adjustable retractable handle.

3. Market Research Analysis

3.1. Government Fiscal Policy

The Victorian Aids and Equipment Program (A&EP), formerly known as the Program of Aids for Disabled People (PADP), is a Victorian Government program which aims to assist children and adults to access subsidised aids, equipment and home modifications to enhance their safety and independence, support their family and carers and prevent premature admission to institutional care or high cost services.

All equipment purchased by patients, is assessed by, either an Occupational Therapist (OT) or Physiotherapist (PT). These funds are allocated to 14 Metropolitan and 14 Rural A&EP service providers within Victoria.

Service providers are given a fixed expenditure limit annually and must manage the money to aid as many patients as possible.

Eligible applicants receive financial assistance in the following ACME product related areas:

Electric Wheelchairs	\$6000	OT or PT assessment required
Wheelchair customisation	\$2500	OT or PT assessment required
Scooters (Could buy Flexi)	\$4000	OT or PT assessment required
Bed rails and cot sides	\$200	OT assessment required
Full service cost coverage on batteries replacements		

ACME questionnaires conducted with 8 of the metropolitan A&EP service providers, identified that a low cost wheel chair could allow savings that would help aid more patients (see appendix 9.2). Also patients eligible for scooters would be at an advantage if the ACME chair retailed at around \$4000 dollars as a portable electric wheelchair is more favourable than a scooter (see figure 5).

The survey generated much interest not only in wheelchair development but also in the improvement of all products listed on the A&EP subsidiary lists and further highlighted a need in developments of carer and nursing aids.

3.2. Wheelchair Market Analysis

The ACME wheelchair market is one that is made up of 3 affecting factors:

- The ongoing number of new mobility challenged people from injury, disease or age (see figure 3)
- The Baby Boomers effect and shifting age distribution (see figure 2)
- Increased average life expectancy (see figure 4)

Statistics printed in a document published by the Australian government (Aged care assessment program National minimum data set report) indicated that 193,000

Australians suffered from a disability in 2001 (Approx. 1%). Of this population 34.7% were mobile disabilities. This figure had steadily risen since the previous year by 5.3%. This would make approximately 66,971 Australians suffering for a mobile disability in 2001, of which 24.7% are Victorians (16,541 see figure 1). If this continued to grow at a rate of 5% each year then currently 19,148 Victorians would be suffering from mobile disabilities.

According to **Baby Boomer Statistics** (see Figure 2) the expected growth in disability due to elderly citizen population distribution could be expected to continue to rise a further 5% each year until 2011 and then remain constant for a further 20 years there after. Therefore Australia currently has approx. 957 new mobile disabilities occurring each year.

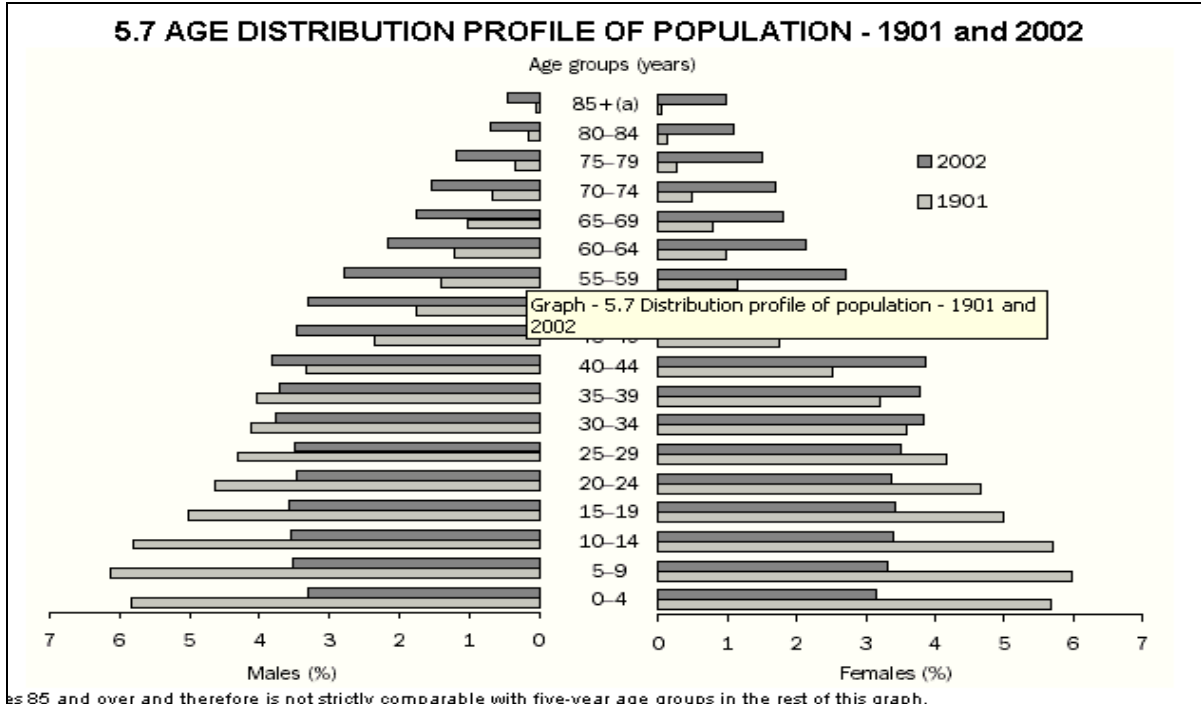
Based on figures for **Average Mortality Rates** published by the Australian Health Statistics (see figure 3), an average of 0.67% of Australians died each year. This is a moving average of which 1% would suffer new disabilities and again 34.7% of these are mobile disabilities. Generating a number of new cases due to a standard move in Victorian population of $4,804,700 \times 0.67\% \times 1\% \times 34.7\% = 110$ new cases per year.

Retention of mobile disabilities could further be expected since there is an increase in life expectancy, thus prolonging the need for electric wheelchairs. These figures would generate further market for maintenance and manufacture. This additional volume won't be considered, as exact statistics are not definable.

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Aust.(a)
30 June	'000	'000	'000	'000	'000	'000	'000	'000	'000
1901	1,361.7	1,203.0	502.3	356.1	188.6	171.7	4.8	..	3,788.1
1912	1,742.9	1,355.9	635.6	422.9	302.0	189.1	3.3	2.1	4,653.7
1922	2,154.4	1,570.4	779.3	503.7	341.5	213.9	3.7	2.9	5,569.9
1932	2,578.2	1,807.8	937.7	578.1	435.1	226.4	4.9	8.6	6,576.8
1942	2,828.7	1,962.6	1,039.8	608.3	477.0	240.9	9.1	14.4	7,180.7
1952	3,339.5	2,344.5	1,259.5	755.1	599.9	296.3	15.5	26.4	8,636.5
1962	3,986.9	2,983.1	1,551.0	987.5	766.0	355.7	46.0	66.2	10,742.3
1972	4,795.1	3,661.3	1,898.5	1,214.6	1,082.0	400.3	92.1	159.8	13,303.7
1982	5,303.6	3,992.9	2,424.6	1,331.1	1,338.9	429.8	130.3	233.0	15,184.2
1992	5,962.6	4,455.0	3,030.0	1,456.5	1,658.0	469.8	168.1	294.7	17,494.7
2000	6,486.2	4,741.3	3,561.5	1,505.0	1,874.5	471.4	195.6	315.2	19,153.4
2001	6,575.2	4,804.7	3,628.9	1,511.7	1,901.2	471.8	197.8	319.3	19,413.2
2002	6,640.4	4,872.5	3,707.2	1,520.2	1,927.3	472.7	198.0	321.8	19,662.8

Figure 1

Australia Bureau of Statistics 2004, POPULATION By states and territories



es 85 and over and therefore is not strictly comparable with five-year age groups in the rest of this graph.

Figure 2

Australian Historical Population Statistics - on AusStats (3105.0.65.001); Australian Demographic Statistics (3101.0).

Table 2.14: Age- and sex-specific distribution of deaths, 2002

Age (years)	Males		Females		Sex ratio	
	Number	Age-specific rate ^(a)	Number	Age-specific rate ^(a)	Crude ^(b)	Age-specific ^(c)
0	699	553.6	565	471.2	124	117
1-14	374	19.5	244	13.4	153	146
15-24	1,058	76.4	382	28.6	277	267
25-44	3,772	129.5	1,884	63.9	200	203
45-64	11,609	502.7	7,162	311.7	162	161
65-84	36,889	3,626.5	28,766	2,412.4	128	150
85+	14,433	16,440.7	25,787	13,389.1	56	123
Missing age	51	..	32
Total	68,885	705.7	64,822	653.9	106	108

Figure 3

Average Mortality Rates, Australian Health Statistics 2004

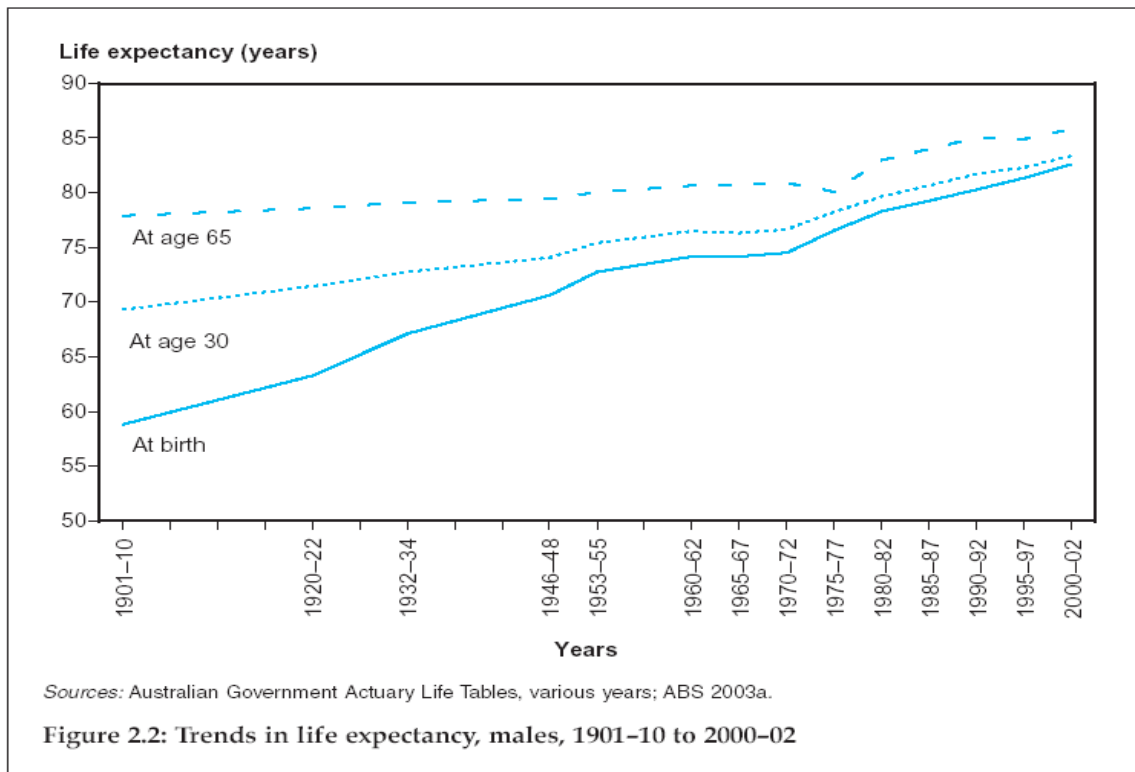


Figure 4
Average Life Expectancy, Australian Health Statistics 2004

In summary the following market is expected:

- Currently 19,148 Victorians are suffering from mobile disabilities
- Approx. 957 new mobile disabilities per year due to the baby boomers effect
- Approx. 110 new mobile disabilities per year due to moving average effect
- Although there is an effect of increased life expectancy this has been neglected

3.2.1. Pugh's Competitor Decision Matrix

ACME conducted a competitor decision matrix to help identify the potential market share that ACME will possess.

ACME Flexichair as datum. Same = 0

Ratings:

Best = 3	Better = 2	Slightly Better = 1
Worst = -3	Worse = -2	Slightly worse = -1

ACME Flexichair cost \$3350

	Quickie V121	Chinese import	Trax	Glide	Scooter
Cost	\$4,875	\$3,000	\$6,000	\$5,100	\$1,700
Location	USA	China	AU (W.A.)	AU (W.A.)	China
Portability	-3	-3	-3	-3	-3
Lightweight	-1	-1	-2	-2	1
Comfort	0	-1	2	1	-3
Cost	-2	1	-2	-3	2
Controllability	0	-1	0	0	-3
Manoeuvrability	0	0	0	0	-3
Accessories	-1	-1	0	0	-2
Lead time	-3	-2	-1	-1	-2
Quality	0	-2	0	-1	-3
Service	-2	-3	-1	-1	-3
Total	-12	-13	-7	-10	-19

Figure 5
Pugh's Competitor Decision Matrix

ACME Flexichair is not shown as it is used as the datum. Positive scores prove a better wheelchair, and negative scores a worse. This comparison was made with 5 locally distributed wheelchairs and as can be seen, all have a negative score.

It is evident from the outcome of Figure 6 that the ACME chair has distinct advantages over the competitors. The largest competitor threat is the Western Australian manufacturers. ACME has a great competitive advantage logistically as it is locally situated thus eliminating importation and transportation costs and also reducing lead-time to supply.

3.3. Bedsafe Market Analysis

Based on hospital statistics published in www.aihw.gov.au there were in 2002 78,868 beds available in all hospitals around Australia. ACME proposes that in order to cut spending hospitals may only use the protective bed rails for a portion of beds.

Workers in the nursing industry suggest the Bedsafe product would be used on approximately 50% of all hospital beds. Areas most in need are critically ill, burn patients, aged care, unconscious patients, children, trauma patients and surgery beds.

For conservative estimations ACME has assumed 30%. This would create a potential market of 23,600 beds in Australia alone and further potential for export.

3.4. Porter's 5 Forces Analysis

As ACME is a non established business a Porter' 5 Forces analysis was conducted to identify business sectors with the lowest risk of entry.

Risk Ratings High=3 Med=2 Low=1
Importance ratings High=3 Med=2 Low=1

Business Sectors	Threat of New Entrants	Threat of Substitues	Barg. Power Suppliers	Barg. Power Buyers	Sub total
Flexi Electric Wheelchair	3	2	1	2	12
Elite Electric Wheelchair	3	3	1	2	18
Wheel Chair maintenance	3	2	1	2	12
Engineer Consulting	3	3	1	2	18
Bedsafe	1	2	1	1	2

Multiple factors

Total risk rating Low =>8 Med <8-16 High <16-81

Figure 6
Porter's 5 Forces Analysis

Although **Elite** electric wheelchairs and Engineering Consulting rated as high risks, their rating values are still relatively low. Based on the Porter's analysis, ACME has selected to first enter the market with one technical and one innovative product, being Flexichair and the Bedsafe product.

Although **Flexichair** has a high threat of new entrants ACME has minimised a threat of substitutes with a new innovative design that allows for improved portability.

- The buying power of suppliers is low and gives ACME an ability to drive the base unit costs down.
- The switching cost of an existing chair is very high, therefore ACME can only target customers seeking to buy new wheelchairs.

In the interim period of developing electric wheelchairs ACME will sell competitor wheelchairs with a distributor mark up thus continuing to generate profits to aid research and development and provide a full product range to the customer.

Bedsafe product is one that currently does not exist on the market. The threat of Substitues is medium, as this product is relatively simple to manufacture however ACME plans to flood the market fast to eliminate the chance of competition.

Wheelchair maintenance is a business sector that will be more profitable if a certified maintenance policy is established. Although ACME can still be competitive in the current market the certification and government policies will give ACME a strategic advantage and allow improved service quality to customers.

3.5. Vative's Supplier Competitor Buyer Analysis

Line thicknesses indicate main channels of flow

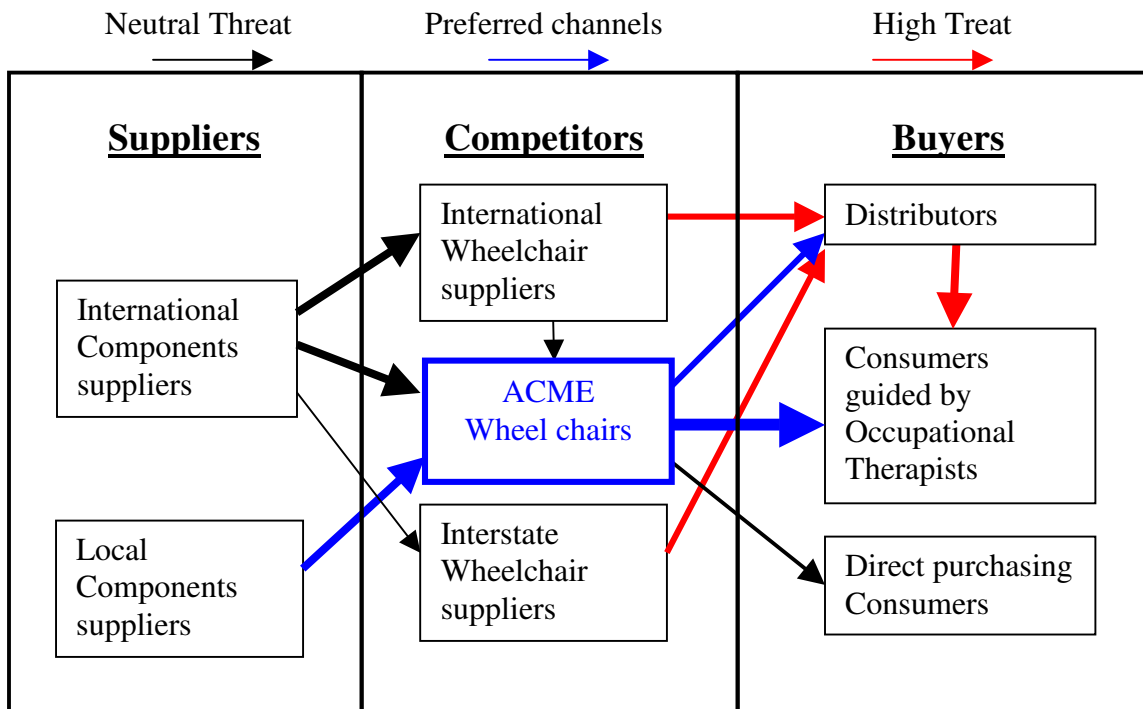


Figure 7
ACME Electric Wheelchair Supplier Competitor Buyer Analysis

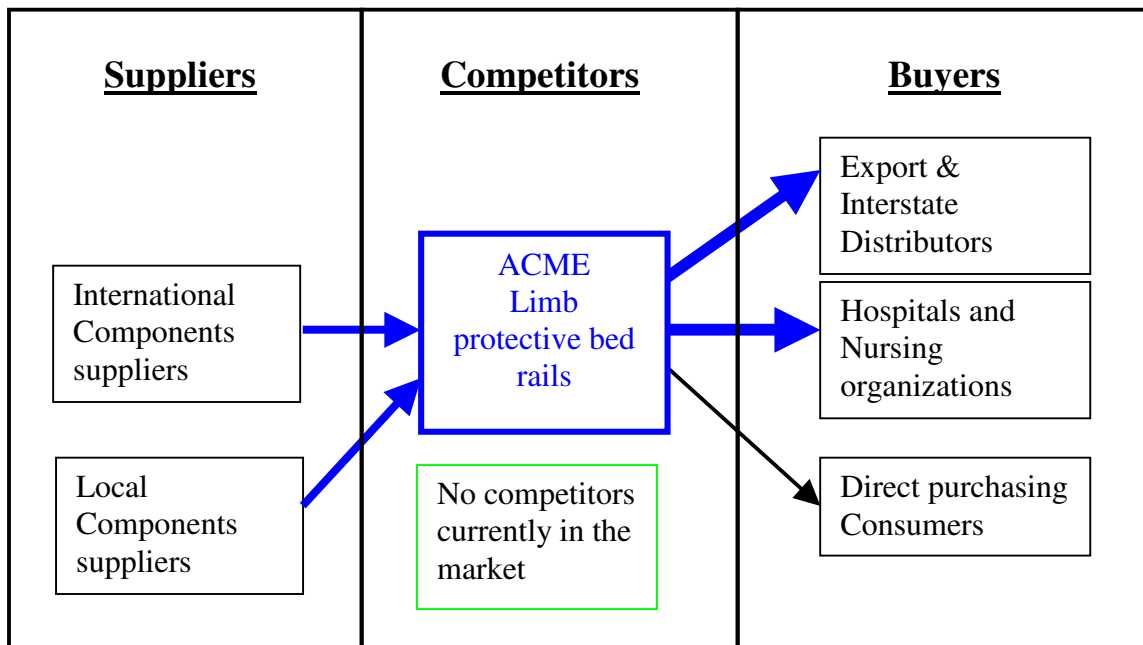


Figure 8
ACME Limb Protective Bed Rails Supplier Competitor Buyer Analysis

The ACME Electric Wheelchair Supplier Competitor Buyer Flow Analysis (see Figure 7) shows that:

- ACME's best form of Sales is directly through OT's and PT's
- Sales made through this area of industry will eliminate a 30-40% distributor mark up (as indicated in Appendix 9.1 Q.1)
- Direct to market sales will also have the same effect although these volumes are expected to be lower as indicated in the Distributor questionnaire (See Appendix 9.1 Q.9)

3.6. Market Analysis Summary

ACME will first enter the market with the **Flexichair** and **Bedsafe** products.

ACME's competitive edge is innovative design and low cost in comparison to the competitors on the low cost wheel chair. The limb protective bed rails are a totally new concept that currently has no competitors and is relatively low cost to manufacture.

ACME market for sales is one that has Demographic, Economic, Political, Technological, Legal and Social aspects and advantages.

- **Demographic** advantage is the continued growth of customers due to the Baby Boomer effect
- **Economic** advantage as labour costs are very small in proportion to importation and transportation cost, this will protect ACME in the local market. ACME's innovative new design that offers more features to customers at a more competitive price will give them the upper hand against competitors
- **Political** - Due to government policy, individuals requiring wheelchairs will always have the opportunity to purchase by utilising the government funding
- **Social** - ACME seeks to generate a social advantage by offering proceeds from the sales of the products to be donated to Spinal research institute, Multiple Sclerosis foundation or age care equipment development centre (ACME). Customers will be able to select where they would like to donate the proceeds.

Based on the total market analysis conducted ACME are confident to calculate sales figures using a conservative assumption of 10% market share in Victoria alone. Further sales could be generated through Interstate sales and export however these are not considered.

Therefore based on a demand total of 1067 new Electric Wheelchairs per year, ACME assumes sales of **107 Flexichairs** per annum.

For conservative estimations ACME has assumed 30%. This would create a potential market of **23,600 beds** in Australia alone and further potential for export.

4. Business Operations

4.1. Business Operations Summary

Entry Strategy

ACME will begin business on a low risk entry strategy. In order to achieve this low risk the first products (Flexichair and Bedsafe) will be designed tested and manufactured using existing contract manufacturing resources and home based offices. The contracts are in place for manufacture and assembly. For letter of contract (See Appendix).

Establishing business relationships

In the meantime ACME will build relationships with government policy makers, OT, PT, and A&EP managers. Reasons: market intelligence, feedback on products, these are the decision makers who control purchasing decisions.

Location

Once the products are industry established and profitable ACME will move into a factory with a display centre. This is when ACME will purchase a full range of mobility products by first filling the gaps with competitor substitutes.

Brand Awareness

This will allow ACME to build up a market name and prepare for launch of new innovative products. Having a full range of products will eliminate the need for customers to search elsewhere for items.

Knowledge and skill development

ACME will continue to gain industry knowledge by repeated interviews, surveys and questions to parties involved with the industry. Extracting valuable information from people in the field is one of ACME's most valuable resources.

Additional Resources

The shop will be staffed with a sales representative to allow for more development and sales work. Timing of this is dependant on product sales.

A team of accredited maintenance and service technicians will be employed according to demand of which ACME can train in house.

For more detailed plans of manufacture please refer to Financial Plans in section 7.

4.2. Flexichair

Launching plan:

Stage 1	Design	Complete
Stage 2	Prototype	In progress
Stage 3	Australian Standards testing	Jan,05
Stage 4	Product launch	Feb,05

Design of Flexichair is in its final stages, all required sub assembly components are ready to be ordered and price arrangements have been made with suppliers. Resources have been established with local manufacturer Probuilt Engineering Pty.Ltd. This company will allow ACME workshop access for assembly of prototype and low volume manufacture thus keeping entry costs and risk very low (see appendix 9.3).

Flexichair Components

Refer to section 6

Total costs including fixed costs	\$2332.00
Sales price	\$3350
Profit Margin	43.6%
Sales forecast	107
Profit	\$91,806

Safety	10	10	10	8	10	10	10	68	9.714
Reliability	10	9	10	10	10	9	9	67	9.571
Ease of use	10	9	10	10	9	10	8	66	9.429
Cost	5	8	8	8	9	9	7	54	7.714
Discharge time	7	7	8	8	7	5	6	48	6.857
Turning circle	7	7	5	6	6	7	8	46	6.571
Weight	5	5	8	5	8	6	8	45	6.429
Size	5	4	8	5	7	8	6	43	6.143
Noise	7	3	6	5	6	5	8	40	5.714
Speed	4	6	4	6	6	7	6	39	5.571
Capacity	4	2	7	5	6	6	7	37	5.286
Aesthetics	3	1	5	2	6	6	7	30	4.286

Figure 9

Shows survey results from 8 wheelchair distributors, these were used to select and prioritise the most important design criterion according to customers needs.

Design criterion

Product Criterion	Priority	Sophisticated controls	Rotate about centre axis	Regenerative braking	Single drive	Transportability	Large A/h rating battery	Low cost components	Standard wheel chair	Lightweight materials	Durable drive systems	Dual drives	Foldable
Safety	12	&	#	&	#	#	#	\$	#	#	&	#	#
Reliability	11	&	#	#	#	&	&	#	#	#	&	#	#
Ease of use	10	&	&	\$	#	#	#	#	#	#	#	#	#
Cost	9	#	&	&	&	#	#	&	&	&	#	#	#
Discharge time	8	#	\$	#	\$	&	&	\$	#	\$	#	\$	#
Turning circle	7	&	&	#	&	#	#	\$	#	&	#	&	#
Weight	6	#	\$	&	\$	\$	#	#	&	#	#	\$	#
Size	5	#	#	#	\$	#	#	#	&	\$	#	\$	&
Noise	4	#	#	#	&	&	#	#	#	#	\$	#	#
Speed	3	#	#	#	#	\$	&	#	#	\$	&	#	#
Capacity	2	#	#	#	#	&	&	\$	&	#	&	\$	#
Aesthetics	1	#	&	#	#	#	#	#	\$	\$	#	&	#
		238	214	206	195	190	174	172	168	162	162	152	98
		Dynamic Shark controller	Twin Dynamic M4 motors	Dynamic M4 motors	Jockey wheel	Easily separated into lightweight pieces	Twin 24 Ah Sonnenschein batteries	Low scale, low cost wheelchair required	Denyers aluminium wheelchair	Aluminium brackets.	Dynamic control & drive system	Rotate about axis	Denyers wheelchair

&=5
 Legend
 \$=3
 #=1

Design Solutions

Figure 10
 Quality function deployment chart is used to score and prioritise different design methods (top row) to aid the development of a product according to the customer needs.

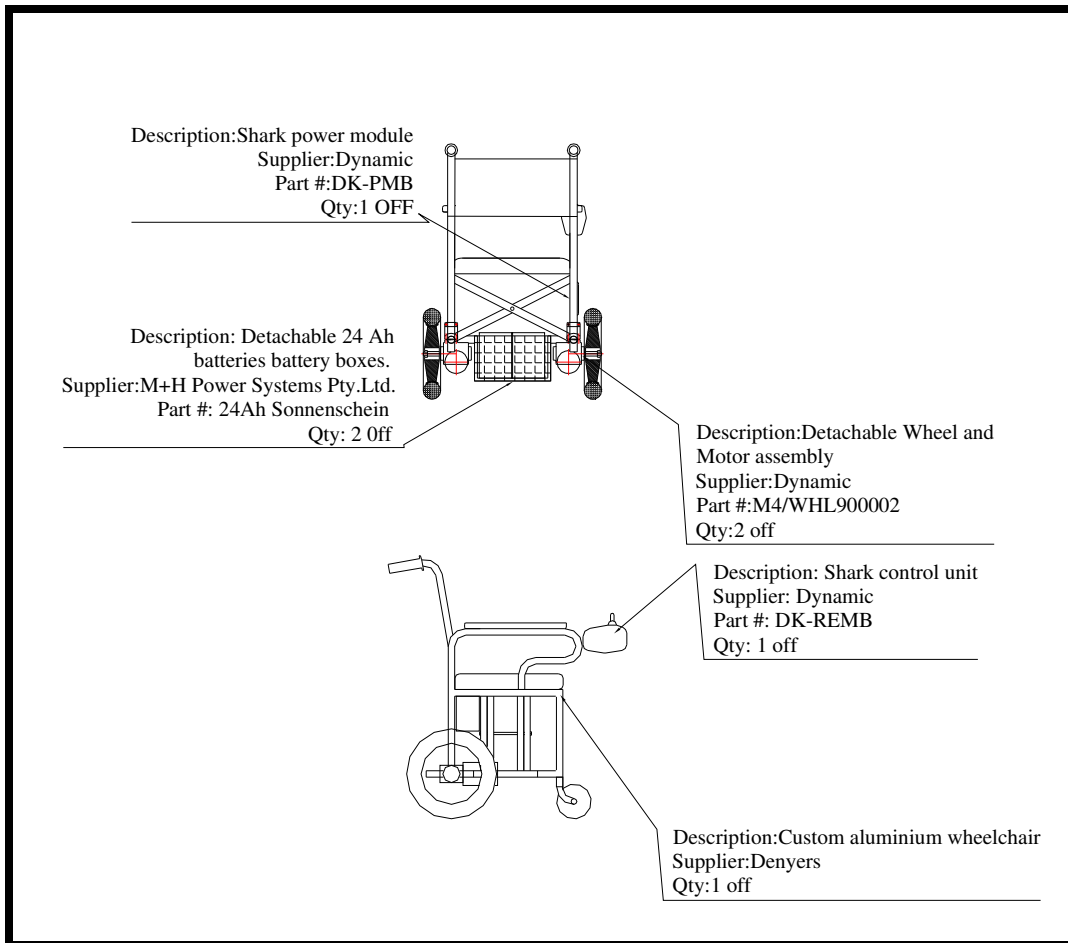


Figure 11
Shows how design solutions are developed into the chair.

Wheelchair BOM	Part #	Contact	Qty	\$/Chair	Price 50off
Shark controller	Shark	Dynamic	1	\$250.00	\$177.50
Shark Power module	DK-PMB	Dynamic	1	\$340.00	\$241.40
Battery connector	Jaycar	Dynamic	1	\$20.00	\$14.20
Thermal 40ACircuit breaker	GCK0011	Dynamic	1	\$55.00	\$39.05
Motors	M4	Dynamic	2	\$660.00	\$468.60
Sonnenchein Batteries	24Ah	M+H	2	\$192.00	\$136.32
Chair	Aluminium	Denyers	1	\$595.00	\$422.45
Battery boxes and mounts	GSM 9949	M+H	2	\$50.00	\$30.00
Wheel assy	WHL90002	Dynamic	2	\$30.00	\$20.00
Controller mount	BR 01	TRJ	1	\$20.00	\$10.00
Power module mount	BR 02	TRJ	1	\$20.00	\$5.00
Battery charger	N/A	M+H	1	\$30.00	\$15.00

Figure 12
Wheel Chair Bill Of Materials (BOM)



Picture 2

A future low cost innovation, allowing active paraplegics to raise themselves to a standing position independently.

4.3. Bedsafe

Stage 1	Concept design	Complete
Stage 2	Design	In progress
Stage 3	Prototype	Feb, 05
Stage 4	Product launch	Feb, 05

Bedsafe concept design is finalised and materials for production are currently being sourced. This product will be manufactured in a small jobbing shop located at the rear of the ACME carer aids display centre.

Bedsafe components

Durable, transparent, breathable material	2m ²	\$25.00
Velcro material	4m	\$5.00
Sewing materials		\$10.00
Labour	10min	\$2.50
Packaging and fitting instructions	1 off	\$2.00
Total		\$39.50
Profit margin		20%
Development		20%
Sales price		\$55.30
Sales forecast (from section 3.3)		23.600
Development revenue		\$186,440
Profit		\$186,440

5. Management Team Profile

Mr Example 1:

- Trade certificate
- 3 years of manufacturing maintenance experience
- 1 year in special purpose machine designs and workshop management
- 4 years of project management and industrial Engineering experience specialising in ergonomics, union negotiations, lean systems development and innovative product design
- 1 year of production and manufacturing Engineering experience in a high automation international automotive manufacturing company
- 1 year experience in Business management of a private business
- Currently studying an Manufacturing Engineering & Management degree
- Top ten qualifier in the Victorian young achievers awards

Mr Example 2:

- Trade certificate
- 2 year special purpose machine building and design experience
- 2 years of project management and industrial Engineering experience specialising in handling systems, system integration and innovative product design
- 1 year in logistic process development in a high automation international automotive manufacturing company.

ACME recognises a short-term gap in sales and marketing/ health industry liaison. ACME may seek to employ an OT that could directly liaise with the hospitals and patients. A number of eligible candidates currently exist and are being assessed for team value.

6. Financial Plan and Projections

Explain how market for base chairs not sustainable, look at future export market.

6.1. Flexichair Fixed Costs

Fixed Costs

Description	Cost	
Fax and computer	\$800	
Pedestal Drill Press	\$500	
Welder	\$1,500	
Grinder	\$200	
Power, Lighting @ \$80/month	\$960	
Rental \$1300/month (Moordialloc) approx 300sqm	\$15,600	Kevin Nixon Allan Walton Ph:9570 1300
Outgoings \$1200/year	\$1,200	Council rates, water rates, body corporate, insurance
Insurance (liability and property)	\$10,000	Windsor Management Insurance Brokers Daniel Ph:9320-8535
Australian standards testing	\$4,000	
Advertising and web page	\$5,000	
Total	\$38,960	

Assumptions

Costs calculated over one year. Depreciation values not included. (See attached sheet)

6.2. Flexichair Direct Materials Costs

Direct Materials

Description	Cost per lot size	Purchase Quantity	Unit	Quantity Req. per Chair	Unit	Cost per Unit (\$)	Cost per Chair (\$)
Controller	\$175	1	ea	1	ea	\$175.00	\$175.00
Controller bracket	\$10	1	ea	1	ea	\$10.00	\$10.00
Power module	\$238	1	ea	1	ea	\$238.00	\$238.00
Power module bracket	\$4	1	ea	2	ea	\$4.00	\$8.00
Chair frame and wheels	\$417	1	ea	1	ea	\$417.00	\$417.00
Batteries	\$106	1	ea	2	ea	\$106.00	\$212.00
Circuit breaker	\$20	1	ea	1	ea	\$20.00	\$20.00
Battery terminals	\$10	1	ea	1	ea	\$10.00	\$10.00
Motors	\$231	1	ea	2	ea	\$231.00	\$462.00
Wheel assembly	\$50	1	ea	2	ea	\$50.00	\$100.00
Battery box and clamp	\$50	1	ea	2	ea	\$50.00	\$100.00
Sub Total						\$1,752.00	

Assumptions

Frame supplied powder coated and with footrests

Motors are not removable

Battery pack x 2 removable

screws included in bracket costs

6.3. Flexichair Indirect Material Costs

Indirect Materials

Description	Cost per lot size	Purchase Quantity	Unit	Quantity Req. per Chair	Unit	Cost per Unit (\$)	Cost per Chair (\$)
Drill Bits dia. 12mm	\$5	1	ea	0.05	ea	\$5.00	\$0.25
Tap M10	\$12	1	ea	0.05	ea	\$12.00	\$0.60
Power Hacksaw Blade	\$60	1	ea	0.005	ea	\$60.00	\$0.30
Grinding Wheel	\$12	1	ea	0.02	ea	\$12.00	\$0.24
Packaging	\$10	1	ea	1	ea	\$10.00	\$10.00
Paper and printing manuals	\$2	1	ea	1	ea	\$2.00	\$2.00
						Sub Total	\$13.39

Assumptions

- 1 drill bit makes 20 chairs.
- 1 tap makes 20 chairs.
- 1 hacksaw blade cuts 200 chairs.
- 1 grinding wheel deburs 50 chairs.

6.4. Flexichair Direct Labour Cost

Direct Labour

Description	Frequency	Time Required	Unit	Labour rate (\$)	Unit	Cost per Chair (\$)
Load frame, mount motors and wheels (2 off)	2	0.083	hr	\$25.00		\$4.17
Mount power module	1	0.033	hr	\$26.00		\$0.87
Mount controller	1	0.033	hr	\$27.00		\$0.90
Mount batteries onto chair (2off)	2	0.083	hr	\$28.00		\$4.67
Route wire loom and fasten	1	0.083	hr	\$29.00		\$2.42
Test unit function	1	0.167	hr	\$30.00		\$5.00
Packaging and attach relevant documentation	1	0.167	hr	\$31.00		\$5.17
material handling and waste control	1	0.167	hr	\$32.00		\$5.33
Total		0.82	hr	Sub Total		\$28.52

Assumptions

- Packaging supplied by distributor.

6.5. Flexichair Indirect Labour

Indirect Labour

Description	Time Required	Unit	Labour rate (\$)	Unit	Cost per chair (\$)
Donation to charities					\$100.00
Delivery costs	2.00	hr	\$22.00	hr	\$44.00
1 Staff member for administration	1.00	hr	\$30.00	hr	\$30.00
Sub Total					\$174.00

6.6. Flexichair Costing Summary

Summary

Volume calculation per year (v)	107
Variable Cost / Unit (a)	\$1,967.91
Fixed Cost (b)	\$38,960.00
Cost per chair = a + (b/v)	\$2,332.02
Profit margin %	36%
Direct sales profit margin	7.6%
Profit	\$708.45
Direct sales profit	\$858.01
Tc = a + bx = Total cost	
Sc = (Tc + %profit) = Sales cost	\$3,171.55
Sale price (Incl. 15% direct to industry)	\$3,348.78
Sale price (Incl. 30% distributor mark up)	\$4,123.01
Break even Calculation	
X = volume to break even	Break even @
X =	55
X if all direct sales	45
Total Profit per year	\$75,803.76
Direct sale profit per year	\$91,806.78

Assumptions

Calculated at 225 working days per year

6.7. Bedsafe costing information'

Bedsafe fixed costs have been absorbed into the Flexichair costing.

Bedsafe components

Durable, transparent, breathable material	2m ²	\$25.00
Velcro material	4m	\$5.00
Sewing materials		\$10.00
Labour	10min	\$2.50
Packaging and fitting instructions	1 off	\$2.00
Total		\$39.50

Profit margin	20%
Development	20%
Sales price	\$55.30
Sales forecast (from section 3.3)	23.600
Development revenue	\$186,440
Profit	\$186,440

7. ACME Growth Prospects

Company Growth Prospective

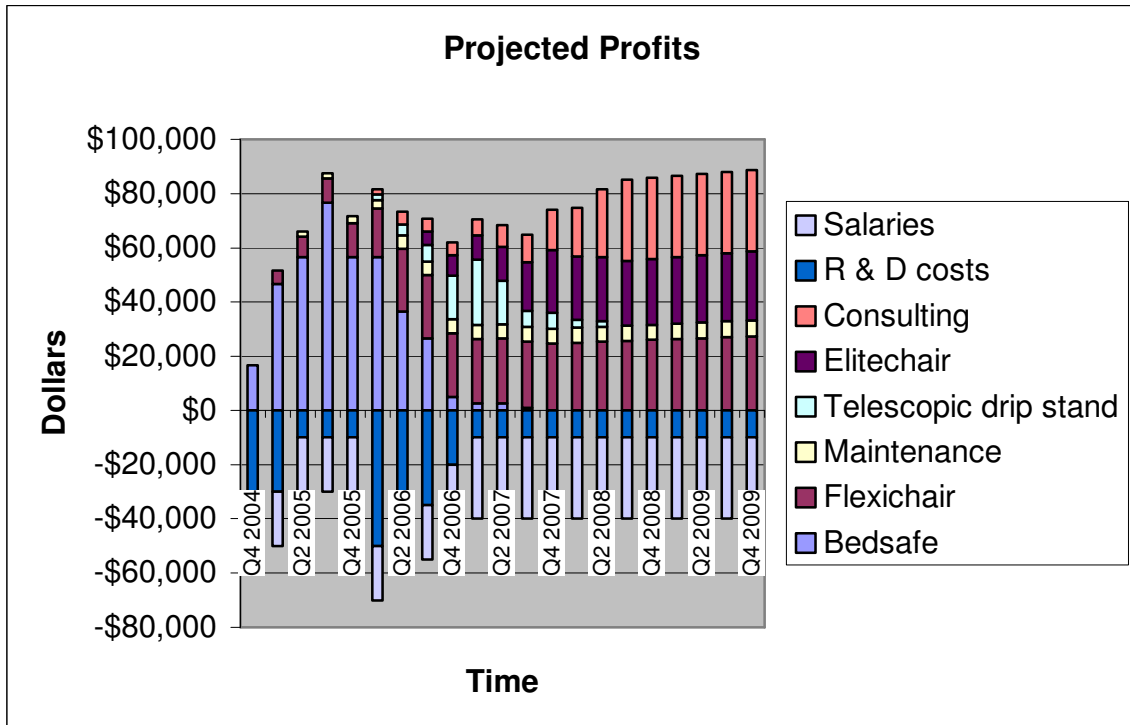


Figure 13
Combined Product Projected Profitability

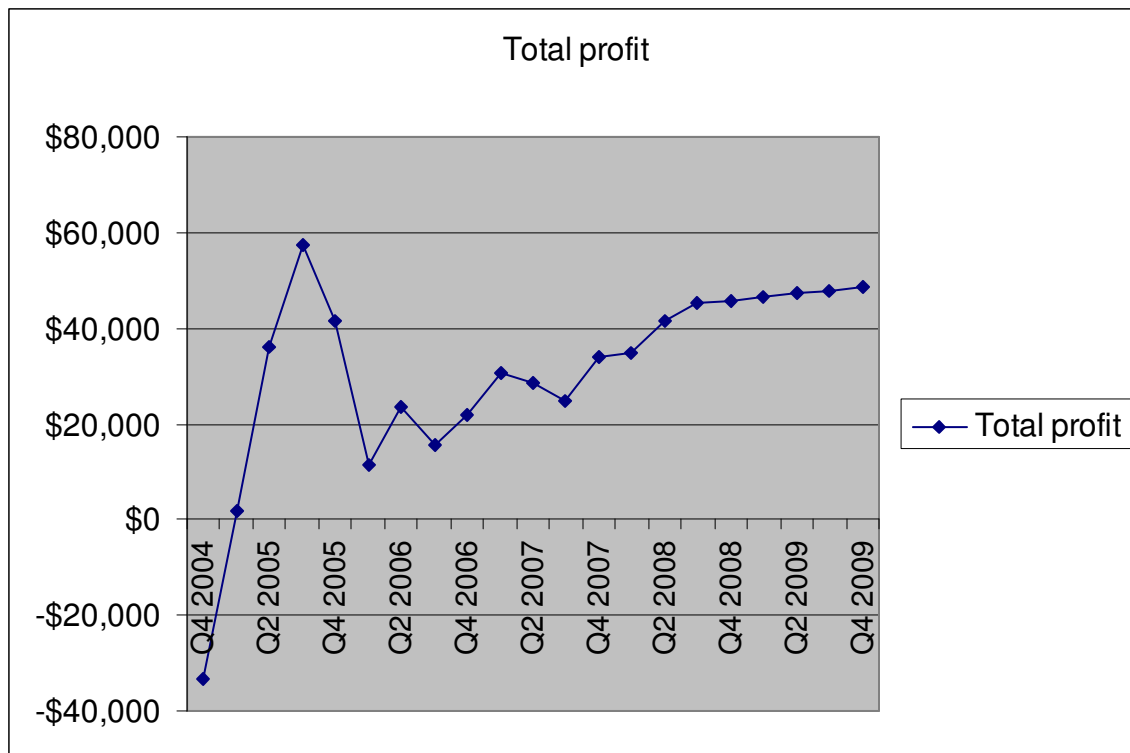


Figure 14
Total Profit

These business areas consist of three primary sectors:

1. Sustained growth products (Electric wheel chairs)
2. Services (Consulting and Wheelchair maintenance)
3. New innovative hospital and carer institution products (Limited life cycle)

ACME has identified through market research that a single product alone will not generate sustained growth. Based on these findings ACME plan to launch multiple profitable sectors in the industry and maintain a competitive edge by launching new innovative products and new innovative ways to better manage matured existing systems. ACME will achieve this by using experience gained of successful methods and practices used in the manufacturing industry.

ACME does not expect to become instantly highly profitably but achieve constant positive growth. This will be achieved by recirculating profits generated back into research and development of innovations discovered. The constant discovery of new innovative products will occur through OT and PT recommendations and constant industry research.

ACME will use the following generic strategy on all products. Obviously each product will have a tailored plan to suit the market, competitors and distributors.

Product Life Cycle Strategy

Introduction Stage

Product quality and consumer awareness is established. Pricing will be low to attract customers and eliminate competition. Distribution will be to selected facets of the medical industry to maximise the growth of customer and industry awareness.

Maturity Stage

Product features will be enhanced to further improve and eliminate competition. Pricing will slightly increase as customer product confidence grows, however remaining competitive. Incentives offered to attract further business and additional differentiation for competitors. Electric wheelchairs will remain in the maturity stage for a long period of time due to the constantly growing need. ACME will attain a competitive advantage in this field by offering customers further innovation and quality.

Declining Stage

Product features will be further enhanced to further sustain product life and market share. Pricing will decrease as sales diminish. Once sales dwindle low and the market is saturated, processes for innovative products could be sold to companies wishing to continue the product or add further innovation.

8. References

Aged care assessment program, Australian Government
<http://www.newcastle.edu.au/news/uninews/june02/elect.html>
<http://www.aihw.gov.au>
http://www.aihw.gov.au/hospitaldata/hospitals_at_glance.html
http://www.marketingteacher.com/Lessons/lesson_plc.htm
http://hnb.dhs.vic.gov.au/ds/disabilitysite.nsf/pages/pub_aids
www.ilc.com.au/
www.dynamics.com
www.lr.com.au
www.mobilityplus.com.au
<http://www.lean.org>

9. Appendix

9.1. Distributor Questionnaire

Wheelchair Distributor Questionnaire

Distributors Surveyed

A. Lifestyle and Rehab (L & R)

Location: Brunswick Contact: Shane Walker Date: 21/08/2004

B. Linds Rehabilitation Equipment

Location: Hallam Contact: Steve Flintoff Date: 24/08/2004

- 1) What percentage markup do you sale your model at?
 - a) 30-35%. Normally are given a recommended retail price
 - b) 35-40%
- 2) How many of your models are locally manufactured?
 - a) 1 only. Trax made in WA
 - b) Full series of chairs from Glide made in WA
- 3) What are your best selling models?
 - a) America model named Quickie B222, F55 and F66 next popular is the Trax
 - b) Glide series 6 & 8. These are the top and mid range models
- 4) What features do you think consumers mostly desire?
 - a) Comfortable seating systems. Adjustable pressure points and angles (J system)
 - b) Upgrade ability, tilt recline and independent suspension
- 5) What are the warranty periods on you model range?
 - a) 2 years electrics and 5 years on the frames
 - b) 12 months standard
- 6) What is your estimation of warranty returns within the first year?
 - a) Rare to have returns normally less than 5%, servicing conducted in stores
 - b) Only 1% normally user errors and not genuine warranty returns
- 7) What are the common failure modes?
 - a) Armrests, and mostly moving parts
 - b) Motors burnt out
- 8) Where are most of your models sold to? (Direct to public or organizations)
 - a) 60% public funded clients, 30% insurance (TAC, Work Cover) & 10% private
 - b) Institutions and direct to public
- 9) How many chairs would you sell a year?
 - a) 120-180 of the full range (10-15/month) 60 of the foldable range only
 - b) 50-70 of the full range (5/month) 15-20 of the foldable range only
- 10) Is there sales fluctuation according to seasons?
 - a) Fluctuation according to financial year. When A&EP is granted new budget by the government
 - b) Same response as a)
- 11) Would you be interested in selling a new, locally manufactured model?

- a) Yes. There is a market for a lower model. They have one at \$4000. Hospital spend up to \$5000
 - b) Depends on what the chair has to offer
- 12) Do you handle accessories sales also?
- a) Yes
 - b) Yes
- 13) Which countries are your models imported from?
- a) America and China
 - b) Taiwan, China and Spain
- 14) What is the cost for importation per chair?
- a) USA and UK \$400-600/chair. China they come in bulk and have a lower cost
 - b) Unknown
- 15) What is the lead time for importation?
- a) 6-8 weeks. Great benefits in reduction customers want instant purchases
 - b) 4-6 weeks
- 16) Do you make sales Nationally?
- a) Yes setting up a facility in QLD
 - b) No just VIC
- 17) What is the postage cost to other states?
- a) \$50-100
 - b) Buyer pays
- 18) How do your customers find you? What age group are they?
- a) Powered chairs are not normally elderly. Mainly kids-40yo
 - b) Direct deal with Occupational Therapist (OT)
- 19) What is your best advertising method?
- a) N/A
 - b) No advertising
- 20) Is the electric/foldable wheelchair designed much more structurally?
- a) Yes
 - b) Yes
- 21) Do electric/foldable wheelchair manufacturers build their own chairs?
- a) AC mobility manufacture their own. Most tend to use the same controllers
 - b) N/A
- 22) Are any electric/foldable wheelchair produced in Australia? Why not?
- a) Yes, Trax and Glide, both in WA
 - b) Same answer
- 23) Do any electric/foldable wheelchair use large wheels?
- a) Yes it was tried and not very popular
 - b) N/A
- 24) Large, small wheels, pro's & con's?
- a) Large wheel avoid jamming in rail road tracks etc.
- Centre drive wheel systems have less chance of tipping and generally climb pavements ramps much better

9.2. A&EP Questionnaire

A & EP Questionnaire

A & EP Centres Questioned

C. Maroondah Hospital

Location: Ringwood Contact: Sandra Black Date: 01/09/2004

D. St Vincents Hospital

Location Fitzroy Contact: Anette King Date: 01/09/2004

E. Melbourne Extended Care and Rehabilitation Service

F. Location: Parkville Contact: Sue (7 months exp.) Date: 01/09/2004

Notes not recorded for other 5 areas interviewed.

- 1) Do you see a benefit in reduced costs in electric wheelchairs and other mobility aids?
why?
 - a) Yes as long as the quality is maintained. It will allow the client to save money and there will be more money overall for patients
 - b) Yes, it will provide more aids and equipment for those in need
 - c) As in b)
- 2) Do you feel that the current wheel chair designs lack any features that the user may require?
 - a) Difficult terrain for patients, requires larger battery capacity. Tilting, electrical elevating leg rests, custom settings and mid wheel drive.
 - b) Speak directly to OTs
 - c) No response
- 3) What are the percentage breakdowns of user types (eg. MS, paraplegics, back injuries, rehabs)?
 - a) Will analyse and send data
 - b) Mainly live in chairs
 - c) No response
- 4) What features do you think consumers mostly desire for each disability?
 - a) Head support
 - b) No response
 - c) No response
- 5) What is your purchasing system and how do you select a supplier?
 - a) Case by case. OT will trial 2-3 chairs and make a recommendation
 - b) Case by case. According to client needs and best price
 - c) Case by case
- 6) Are you fixed to a certain supplier?
 - a) No. Generally use wheel chairs Victoria
 - b) No
 - c) No
- 7) How many electric wheel chair applications would you have a year?
 - a) 7 last year @ \$60,202
 - b) 1-2 a year

- c) Basic chairs 1 and five tilt chairs waiting approval
- 8) Do you have a need for customizations?
 - a) Most always customised
 - b) No response
 - c) No response
- 9) Where do most of your application come from (Hospitals, public, etc)?
 - a) From community health centres, SCOPE, MS societies and other centres
 - b) No response
 - c) Nurses and Ots for wheelchairs
- 10) Are there any other areas that you believe are over priced?
 - a) All maintenance and repairs are overcharged at \$80/hr and hard to find
 - b) No response
 - c) No experience
- 11) Generally how much would a patient pay over the government assistance for an electric wheel chair?
 - a) About 10%, therapist will find top ups from other funds
 - b) No response
 - c) Depends on situation
- 12) Can a patient spend to full amount funded by the government or do the OTs select their equipment for them?
 - a) OT will advise the patient and in the end the patient will pick
 - b) No response
 - c) OT will advise the patient and in the end the patient will pick
- 13) Are other states in Australia using a similar model?
 - a) Yes
 - b) No response
 - c) Yes think it is Australia wide
- 14) Do you feel that the public is well aware of the system?
 - a) This disability industry is well aware
 - b) No response
 - c) Community health centres are aware
- 15) Do you see any other areas for improvement?
 - a) The main problem is a lack in funding
 - b) No response
 - c) Would not like to comment
- 16) Who is the government contact for this policy?
 - a) Project worker Caroline Glover
 - b) No response
 - c) Caroline Glover

9.3. Contract Agreement