

Prosthetic Leg for Rural Amputee: Replacing A Limb, Regaining A Life

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ABSTRACT

A prosthesis is meant to facilitate amputees who have lost a part of the body that may have been due to accidents, sickness, or missing at birth. In this case study, a 46-year-old Malaysian man, Mr. Maniam received an amputation surgery following his workplace incidents back when he was a 16-year-old boy. The Social Security Organisation (SOCSO) was established for the principal and immediate employers who have employed one or more employees to register and contribute to this organization with the rates that have been specified under the Employees' Social Security Act 1969. Through this, Mr. Maniam's industrial accident was covered under its Employment Injury Scheme. Mr. Maniam now has a better quality of life and is now a workshop supervisor with the aid of a prosthetic leg.

Keywords: Limb amputation; industrial accident; employment scheme; quality of life

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PROLOGUE

“Six major assignments in three days! Those TV ads...” Azim panted under his breath. He looked behind down the long muddy path he had tread. From a distance, he could see his car parked some 400 meters away. He slapped at his cheek as a tiny mosquito made its escape after a failed attempt for his blood. “Not today, *Aedes*. Not today.” Azim turned and continued uphill on the narrow track. It was a long climb, but it was the only means of reaching Mr. Maniam’s house.

Since the latest series of promotions done by SOCSO, the workload shot up tremendously. The organization received a lot of queries and claims, especially from those living in urban metropolitan areas. Those are people who had the privilege to the information superhighway such as television and the world-wide-web.

However, this case was special to him. Out here in a small settlement known as Bekok, lived Mr. Maniam, a rubber tapper with no access to the outside world, and yet this 46-year-old gentleman has been a SOCSO client since 1989. Azim discovered Mr. Maniam’s file by chance when he was looking through the old archives for a case reference. It was a thick ancient dossier filled with age-old documents and hand-penned letters.

He made a personal call to Mr. Maniam, to find out how he was coping and if he was receiving the support he needed. They had such a great time conversing over the phone that Azim felt that he just had to meet him in person. In a time when SOCSO is undergoing rapid expansion, it was important to him that the coverage reaches all aspects of the community. Not only to the urban population but also to those living in the rural outskirts - to those who really needed and depended on all the help they can get.

Finally, Azim made it to the flatland and there he saw standing by a wooden house, an aged but spirited man eagerly waiting.

“Masuk, masuk...” he said with a kind smile, inviting Azim into his home.

DEC 15TH, 1988

“Yelembu, yelembu. Widinjirichu”

Maniam felt his shoulder being shaken. 4 am. Time to get up. Maniam groaned and got up reluctantly. His day had started whether he was ready or not. He knew he had 15 minutes to wash up before the truck left for the estates. He groggily made his way outside. Feeling the ice-cold water rush upon his face really fired up all his senses and he was ready to go. He went back in and ate the bread his amma passed to him and washed it down with some water. His appa was already waiting outside. He wished his amma goodbye and joined his appa. With eyes that were not as groggy as before, he looked around. Beside him, others were also slowly making their way out from their own wooden homes. Huts. Beyond him, stretched acres of land, and in that land, hundreds of trees; rich with clear, viscous liquid. Those trees would ensure that there was food on the table at the end of the day.

Maniam’s family worked as rubber tappers. They had to start early, sometimes as early as 3am, but that was something he was used to after 16 years of living in the estate. The work was done in the early morning before the day's temperature rises, so the latex would drip longer before coagulating and sealing the cut. Just before noon, they would collect the latex, put them in tins and walk them to the rubber factory. The process of converting latex to rubber sheets was simple, really. There was nothing fascinating to it, neither was there any magic involved. Maniam found himself wishing much later; that perhaps if the process was fascinating, or even interesting, he would have paid more attention. Attention, that would have saved him.

THAT LIFE CHANGING EVENT

Maniam worked in the sheet forming department with twenty other workers. They were mostly youngsters like him, carefree and naïve. To make rubber sheets, only one type of machinery was needed: a mangled machine. The machine functioned to wring out excess liquid as the thick rubber slabs are pressed into thinner sheets. The set of rollers leaves a ribbed pattern on the sheets that increases the

surface area and hastens to dry. The sheets are dried for up to a week in smoke houses before being packed and shipped.

It was already mid-afternoon, and Maniam was on his usual routine, feeding thick rubber slabs into the mangle machine, oblivious to the fact that life as he knew it, was about to change.

As he heaved a particularly large slab into the machine, he slipped, and his right leg went right in between the rollers.

It happened so quick and the machine, being a machine, continued doing its job. As if his leg was another piece of thick rubber slab, the roller squeezed and crushed it like it was nothing. Then came the pain. Pain like he never felt before.

He heard cries of alarm then, or maybe, they were his own cries of pain.

It was almost a 2-hour journey to the nearest hospital, Hospital Segamat. He did not remember how his then mangled leg and himself made the journey. He must have passed out at least a few times. When Maniam, his appa and his amma, finally made it to the hospital, he thought that the pain would stop. He was young and naive, you see. He had this perception that doctors would equal to the pain going away. Not true, he quickly realised. Due to the lack of manpower and overwhelming number of patients, Maniam was only brought into the x-ray room after 3 hours of waiting.

Traumatic crush injury of the right lower limb: that was the diagnosis given to them. The doctors who treated him performed a minor surgery trying to salvage what was left of his foot but due to the nature of the injury, they recommended an amputation to be done at the ankle level.

Table 1: Excerpts from medical report of Mr Maniam

<p><i>“Extensive lacerations of the Right leg and foot with fractures of:</i></p> <ul style="list-style-type: none"><i>i. Right first Metatarsal bone</i><i>ii. Head of the 3rd right metatarsal bone</i><i>iii. Shafts of the 4th and 5th right metatarsal bone</i><i>iv. Right calcaneus</i><i>v. Tips of the distal phalanges of the right 3rd and 4th toes which progressed to gas gangrene of the right leg”</i>
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“No!” Maniam refused. He was only sixteen! He was not ready to lose any part of his body. His father begged for an alternative, but there was no specialist available at the time to advise. Believing he was making the best for his son, Maniam’s father decided to bring his

son to a specialist hospital. That hospital, however, was situated in Johor Bahru, some 200 kilometres away.

Four hours, and one frenzy drive through the thunderstorm later, they arrived at Johor Specialist Hospital. Unfortunately, the infection had set in by then and he had developed gas gangrene over his right leg. He was admitted immediately for surgery, and he was amputated just seven inches below the knee. Everything happened so quickly it felt unreal. Like an illusion even. He remembers thinking to himself on that day that his life was over, though really, his journey had just begun.

LIFE AS AN AMPUTEE

The year that followed was difficult. Maniam's pride took the biggest hit. He had a difficult time in accepting that he would now need help in everything he wanted to do. Simple things in life like walking and running, things that so many people took for granted, had become the impossible for him. Sometimes, he would feel his right ankle hurting. He would look down, only to remember that he did not have a right ankle anymore. Phantom pain.

Maniam knew he was not from a wealthy family. The wages his family brought in was just enough to get by. Now not only is he unable to generate earnings, but he has also become a huge liability to his family. He spent his days moping in his house, often staring down at his limb, or what was left of it. He was on the verge of depression.

“Maniam! Maniam! Come!”

It was on a sunny Tuesday afternoon, when his amma called out to him. Maniam crawled out to the living area but kept his distance. A well-dressed gentleman was standing by the main door. The man was sweating extensively, probably from the long journey under the hot sun. He introduced himself as Mr Chong and he was from SOCSO. Maniam had never heard of such an organisation.

The company Maniam worked for, however, was an active contributor to SOCSO and Maniam's industrial accident was covered under its Employment Injury Scheme. SOCSO provides social protection in the forms of income replacement and rehabilitation assistance. Amongst the main facilities available are the provision of

rehabilitation devices such as prosthetics, orthotics, and medical aids.

Mr. Chong briefed Maniam on the protection and assistance he was entitled to. How they could help him rehabilitate and regain a meaningful life. After a long period of darkness, Maniam could finally see a ray of hope.

On 20th April 1989, he attended the SOCSO Medical Board in Hospital Segamat and was awarded compensation for his workplace injury as allocated by the Employees Social Securities Act 1969. He was also recommended for a prosthesis fully sponsored by SOCSO.

That was the start of his rehabilitation process. He learnt how to bandage his stump to keep it shaped well. He learnt how to position his leg, how to prevent contractures in his knee, and how to strengthen his body. At the physical therapy gym, he was introduced to using crutches to walk, hop and climb stairs. He was good at it. He was moving again. His therapist, Ms Aliya told him that he should do well, that he was young, fit, and strong, unlike most other people who lost their legs, who often suffered from diabetes and its complications. Things that were simple before, he had to re-learn – such as how to wear his pants, how to transfer into and out of the toilet, and to take care of himself.

It was finally going good for him, and he could not wait to get his prosthetic leg.

“I want to walk again, I want to go back to work, I want to be whole again...” he thought to himself.

His first prosthesis measuring was set to be done the following month. However, his wait was prolonged as he had developed a blister on his stump. Devastated, his turmoil was lasting longer than he wished it to. Thankfully, Maniam had his determined father who was always motivating him and helping him with his internal struggle.

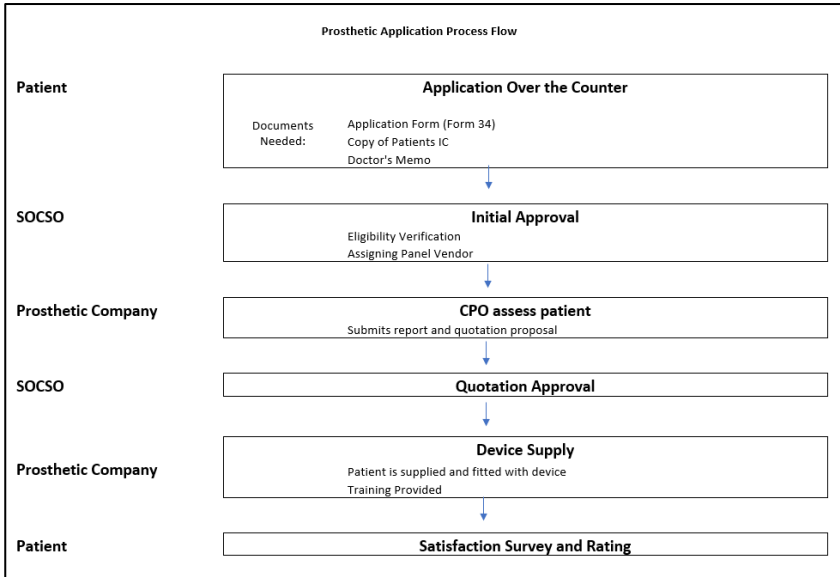


Figure 1: SOCSO SOP Flowchart

A NEW HOPE

Eventually, in November 1989; Maniam received his first prosthesis. It was a right below knee prosthesis set, with a fibreglass socket and SACH foot. After almost a year of his amputation, and continuous effort and struggle, Maniam could walk again.

The ability to walk again, gave him back some sense of control over his life. For someone who had lost all hope in the past year, this was a gift from above. At 18, it was not hard to change his outlook on life. He went from thinking that life was bleak to looking at life with positivity again.

It was different, walking with an artificial leg. It did not have the feel and range of motion of a normal leg. It felt stiff and he could not walk on soft, uneven ground without hurting his knee. Still, Maniam made do with what he had and continued to use it daily.

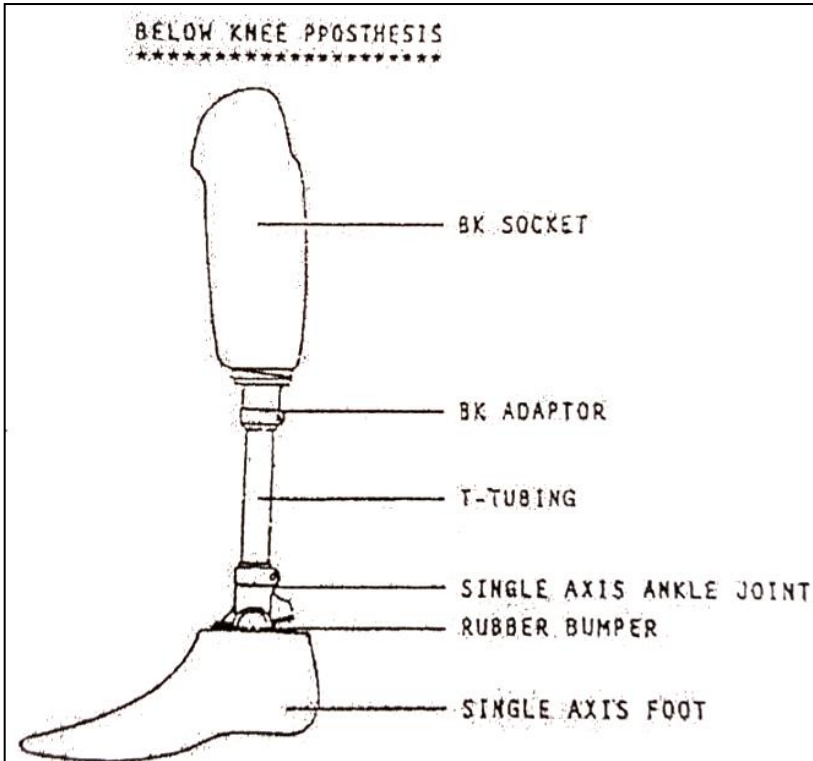


Figure 2: Below Knee Prosthetic Leg Components

One year later, Maniam felt that the leg was getting heavier, at times it would even drop off. He was bending over more and more to one side, hurting his hip over time. He was also developing pressure sores all over, and he could not walk for more than a couple of hours a day. After some time, he felt like he could not walk anymore and even dreaded putting on the prosthesis.

“What was happening? The prosthesis maker must have cheated me and gave me faulty product”.

He was furious, and worried. These things cost a fortune and he could not afford a new one. So, he wrote a letter to SOCSO complaining about the prosthetic company. He cited poor workmanship and low quality. He was relieved to learn that SOCSO does pay for replacement or repair of prosthetic items if deemed necessary by the organisation. They scheduled a session with a prosthetist and Maniam was excited. He was all fired up and ready to have a go at the prosthetist for a badly made prosthesis.

PROSTHETICS 101

Mr. Khairul the prosthetist was very professional and carefully explained the details to Maniam. After prolonged active usage, the volume of his stump has shrunk causing the socket to become loose. Thus, the prosthesis feels heavier and drops off occasionally. Next, was that he had grown taller. As he was still a teenager, his bones were growing longer while the length of the metal pylon remained the same. This led to the imbalance and eventually him bending over more to one side, causing stress to his hips. Finally, a prosthetic socket was custom-made to the shape of his stump. Over time, the volume and length of his stump has changed causing uneven distribution of pressure and giving rise to sores.

Mr. Khairul was very experienced, and he made him a new prosthetic leg, complete with new socket and foot. Maniam received a new custom-made socket, a new pylon and some socks and his prosthesis felt perfect. Mr. Khairul ensured Maniam that the new leg can be re-aligned and refitted to ensure his comfort and ease of use. Maniam was very satisfied with this and thanked Mr. Khairul for the friendly service.

ADULTHOOD

Maniam was getting older. His parents told him that he should find a better job, but he had no qualifications. Rubber tapping and sheet forming was all he had ever known. Once again SOCSO stepped in and offered him a fully sponsored vocational course in the National Agro Industrial Training Centre (NAITC). It was a vocational training centre that offered skills ranging from wiring and electronics, to plumbing and mechanics. He met others like him in NAITC – Aiman, Yau and Hafiz. They were also there in hopes that the course would help them get good jobs. A fresh start. It was hard to not feel optimistic when everyone around you was optimistic. Soon, a year had passed, and he was a graduate of NAITC.

Armed with his certificate, he started searching for jobs nearby, but it wasn't easy. Nobody wanted an amputee. He would be a liability, not an asset. He tried clinging onto the optimism that he had gathered in the one year he spent in NAITC, but it was fast

slipping away. He remembered feeling so dejected once, that he wrote back to SOCSO, sharing his sentiments. Discrimination was not something new to him, and yet it never failed to hurt. He wondered how Yau, Aiman and Hafiz were doing but could not reach them at the time.

“Mereka semua tidak terima saya, sebab saya tidak ada kaki, mereka semua tanya bagaimanakah saya boleh buat kerja. Tolongkan saya carikan kerja. Tolongkan saya hantar sepucuk surat.. Bagaimanakah saya dapat kerja?”

26 July 1992

Using the network of employers registered under SOCSO, Mr. Chong helped Maniam to secure a job at a workshop in Johor Bahru. In January 1993, he started his job as a junior technician and the rest was history.

Fast forward many years later, Maniam had worked his way up and is now the workshop supervisor. He believed in putting in maximum effort and strived to be independent. Still, he was thankful that SOCSO still covered for all his prosthetic repair and replacement needs throughout the years. They had even granted him an upgrade to a multi-axial prosthetic foot to meet the demands and nature of his job.

Table 2: Mr Maniam’s Prosthetic Leg Components Replacements and Repairs

Year	Replacement/Repair	Component	Price (RM)
June, 1989	First Leg	Complete Below Knee Prosthesis with fiberglass socket	1220.00
Oct, 1990	Component Replacement	<ul style="list-style-type: none"> ● Fibre glass socket ● T. Tubing ● Wool Sock 	335.00
Nov, 1990	Component Replacement	<ul style="list-style-type: none"> ● BK Foam Cover ● Nylon sock ● Sport sock ● BK Cosmetic Stocking 	132.00
Jan, 1991	Component Replacement	<ul style="list-style-type: none"> ● BK Foam Cover ● Nylon sock 	129.00

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Year	Replacement/ Repair	Component	Price (RM)
		<ul style="list-style-type: none"> • Sport sock • BK Cosmetic Stocking 	
June,1991	Component Replacement	<ul style="list-style-type: none"> • Foot (unspecified) • Cosmetic Stocking 	212.00
April, 1992	Prosthetic Replacement	<ul style="list-style-type: none"> • Socket (unspecified) • Single Axis Ankle Joint • BK Foam Cover • Cosmetic Stocking 	869.00
Feb,1993	Component Replacement	<ul style="list-style-type: none"> • Single Axis Foot • Sport Sock 	245.50
June,1993	Component Replacement	<ul style="list-style-type: none"> • Ball Bearing • Cosmetic stocking 	38.80
Nov, 1993	Component Replacement	<ul style="list-style-type: none"> • Single Axis Joint Frame 	120.00
June,1995	Prosthetic Replacement	<ul style="list-style-type: none"> • BK Socket • BK Foam Cover • Flat Foot • Ball Bearing • Rubber Bumper • Cosmetic stocking • Screw & Washer 	903.00
Sept, 1997	Prosthesis Repair	(information not provided)	916.00
Feb, 1998	Prosthesis Replacement	<ul style="list-style-type: none"> • Socket (unspecified) • Single Axis Flat Foot • T. Tubing • Combi Sock • Cosmetic Stocking • Nylon Sock • BK Foam Cover 	1142.00
Sept,2001	Component Replacement	<ul style="list-style-type: none"> • BK Vertical Shock Torque Absorber • Comfort Gel 	2175.00
Oct, 2001	Prosthesis Replacement	<ul style="list-style-type: none"> • Below Knee Socket with Pelite Liner • Vessa True Step Spring • Quantum Foot • Comfort Gel • BK Cosmetic stocking 	2290.00
Feb, 2003	Prosthesis Replacement	<ul style="list-style-type: none"> • 1 set Below Knee with Multi Axis Dynamic Response Foot 	7000.00

Year	Replacement/ Repair	Component	Price (RM)
		<ul style="list-style-type: none"> • Comfort gel 	
Feb, 2004	Prosthesis Replacement	<ul style="list-style-type: none"> • Below Knee with Multi Axis Dynamic Response Foot • Below Knee SGRP Socket with Silicone 	9000.00
June,2005	Component Replacement	<ul style="list-style-type: none"> • PTB BK Socket • BK Prosthetic Socks • Silicone Easyliner 	2420.00
July,2006	Component Replacement	<ul style="list-style-type: none"> • PTB BK Socket • BK Prosthetic Socks • Comfort Gel 	1520.00
Jan,2008	Prosthesis Replacement	<ul style="list-style-type: none"> • Complete Set of Below Knee Prosthesis with Spring Energy Foot • Total Surface Contact Socket • Silicone Suspension Sleeve • Fixed socket adapter & Internal Washer • Graphlite Tubing • Tube Adaptor for spring • True Step Spring • Quantum Foot • BK Foam Cover • BK Prosthetic socks • Silicone Easyliner 	9800.00
May, 2013	Prosthesis Replacement	<ul style="list-style-type: none"> • PTB Polyprop Socket with Pelite • Internal Washer & S/S Bolt • Socket Adapter • Hystan Tubing • Adjustable Single axis ankle & foot • Foam cover • Just sleeve • BK Socks • Silicone Easyliner 	8410.00
Oct, 2013	Prosthesis Repair	<ul style="list-style-type: none"> • Vertical Shock Absorber 	2500.00
Jan,2016	Prosthesis Replacement	<ul style="list-style-type: none"> • Single Axis foot • Hystan Single Axis Ankle • PTB Polyprop Socket with Pelite • Silicone Easyliner 	8916.00

Year	Replacement/ Repair	Component	Price (RM)
		<ul style="list-style-type: none"> ● Vertical Absorber ● Rubber Bumper ● Juno Sleeve ● BK Socks 	

EPILOGUE

Now, after 30 years, as Azim looked at Mr. Maniam who is helping his wife prepare dinner on the table after his long day at work, he realized that Mr. Maniam had gone through a lot. They were served hot chai tea. The television was showing a program on one of SOCSO’s ‘Return to Work’ stories of a man who lost his limbs and is now actively working in the corporate sector.

Mr. Maniam noticed his long-lost friend Hafiz was one of them. He excitedly notified Azim – “Look, that’s Hafiz – we did our training in NAITC together last time!”. His eyes sparkled with pride, reminiscing how difficult life was at the time, and how young and hopeful they were.

Mr. Maniam said, “It reminded me of those days when I was amputated and had no one to turn to be a 16-year-old boy in an isolated rubber plantation. If it wasn’t for SOCSO’s coverage and assistance, I can’t imagine how I would have come this far. It was with SOCSO’s continuous support that I received my education and earn my living now. I am thankful.”

Azim smiled with a dawn of realization. To date, SOCSO approves approximately 11,400 rehabilitation devices a year, of which approximately 2,700 are prosthetic devices. In a time where modernization is growing so rapidly, new technology and systems are being developed every day to improve service delivery. So much focus was put on publicity and advertisement and yet, Mr. Maniam is living proof that the most important and most precious aspect of the job as a social security practitioner is the human aspect. Going out in the field to reach those who cannot be reached and helping them get back on their feet. Mr. Maniam might have been one success story for the country’s social protection policy but there are many more out there in desperate need of help. Azim left Mr. Maniam’s home later that day with a new sense of purpose and determination. As he

turned on the ignition of his car and waved goodbye to Mr. Maniam from afar, he knew his course for the years to come and the challenges that lie ahead of him.

“My work has just begun” Azim whispered to himself.