

Stone tools - Aboriginal people are thought to be the first to use ground edges on stone cutting tools and the first to use stone tools to grind seeds. Boomerang - a throwing stick used for many purposes whose design allows it to return to the (skilled) thrower. Woomeera - a spear throwing holder that acts as an extension of the arm thus allowing greater power and range for the spear. "Woomera" was adopted as an appropriate name for the rocket launching range and associated settlement in outback South Australia. Diddgeridoo - a musical instrument whose sound is immediately recognisable. It first appeared 2,000 or more years ago and at the time of European arrival was used in the north western corner of Australia. Agricultural-The stump-jump plough - developed by Robert and Clarence Bowyer Smith in 1876. Its design allowed it to jump over stumps and other obstructions without breaking the ploughshare. The Combine Harvester (later called the 'Sunshine Harvester') - which both stripped and collected the grain was developed by Hugh Victor McKay of Drummarin, Victoria in 1882. It advanced the earlier stripper which had been developed by John Ridley and John Bull of South Australia. In 1916 Headlie Taylor of Henty designed and built a header harvester that could remove the heads from grain which had been flattened by adverse weather. H. V. McKay was now a successful industrialist and manufactured Taylor's improved design in the McKay factories. Many superior varieties of produce including Federation Wheat and the Granny Smith Apple. The Self-Propelled Rotary Hoe - In 1912 Cliff Howard of Gilgandra invented a machine with rotating hoe blades on an axle that simultaneously hoed the ground and pulled the machine forward. You can now find rotary hoes in back yards and small farms throughout the world and for many years the manufacture and export of the Rotovator hoe helped spread this invention across the globe. Cliff was aged 16 when he invented his rotary hoe. Permaculture - an integrated system of sustainable environmental use of land adaptable to a large number of environments to provide shelter, food and human habitat developed by Dr Bill Mollison from the 1970s onwards. Dynamic Lifter fertiliser - From 1969 to the mid 1970s, Norm Jennings developed his patented method of collecting and treating chicken droppings to create the fertiliser pellets branded as Dynamic Lifter. The product is now widely used in the USA, Europe, the Middle East and Asia. Automotive and transportation. Why is the Black Box orange? David Warren's father had died in one of Australia's first commercial airline crashes in 1926, and it was during the 1950s that Warren invented a device for recording voice and data from a plane, analysis of which after a crash may help prevent similar disasters. However, he could not get it developed in Australia. The RAAF weren't interested and the Federation of Australian Airline Pilots declared that "no plane would take off in Australia with Big Brother listening". As a result the invention was championed by the British and manufactured in America. Black Boxes have expanded from their original home on aircrafts and are now fitted on many millions of vehicles worldwide. David Warren's original invention was housed in black bakelite so the British dubbed it the 'Black Box'. Nowadays, aircraft Black Boxes are made in bright orange to make them easy to detect after a crash. The Box Kite (or cellular kite) invented by William Hargrave in the early 1890s during his investigation into the lifting properties of curved surfaces. Hargrave's work was to form the basis of much manned flight that followed. Hargrave himself flew 16 feet on 12 November 1894 by linking a group of such kites together and adding a seat. The Sarohn Engine - an orbital combustion engine invented by Perth engineer Ralph Sarich in 1972. Wave Piercing Catamaran - designed by Sydney naval architect Phillip Hercus. His design went on to form the basis for the ocean going catamarans produced by Incat in Tasmania. The 'Diff' (differential gears) - David Shearer designed a differential gear which he incorporated into the steam car he built in South Australia in 1897. The 'Ute' - A vehicle with the cabin of a car and the rear of a small truck was designed by Lewis Brant at the Ford Motor Company in Geelong, Victoria. 1934 and called a 'Utility Vehicle'. The 'ute' has long been a favourite vehicle for farmers and tradesmen and is part of the Australian landscape. Black Box Flight Recorder - this famous device was invented in 1958 by Dr David Warren at the Aeronautical Research Laboratories in Melbourne. Variable Ratio Rack & Pinion Steering - invented by the engineer Arthur Bishop in 1970. This was quickly adopted by vehicle manufacturers throughout the world. Premix cement truck? - (Whitehat has reason to believe that the cement trucks with large rotating mixing cylinders on the back are an Australian invention, but we are still in the process of confirming this.) Hystoh Scramjet Engine - a very high speed air-breathing jet engine currently in the testing stage developed by a team from the University of Queensland led by Professor Allan Paul. Domestic and consumer products Hills Hoist - the rotary washing line with hoist quickly became and remains a fixture in Australian back yards. The original rotary clothes hoist had been designed by Gilbert Toyne in Geelong in 1912, but Lance Hill of Adelaide further developed the design from 1945 onwards and marketed it under the name of the Hills Hoist. He later added and patented the winding mechanism in 1956. The Electric Drill - was patented by Melbourne inventor Arthur James in 1889. Kiwi Shoe Polish - invented by Melbourne businessman William Ramsay together with his partner Hamilton McKellan in 1904 and launched as 'Kiwi' in 1906, this soon became and still remains the most successful shoe polish in the world. He chose the word 'Kiwi' because of his New Zealand wife. The Two Stroke Lawn Mower - developed in Australia in 1930. Both the two stroke mower and the Hills Hoist featured in the opening ceremony of the Olympic Games in Sydney in 2000. Latex Gloves - developed in Australia in 1945. The notepad was created in 1902 by J. A. Birchall of Launceston when he had the idea of gluing individual sheets of paper together into a conveniently usable form. Telephones - This invention which used telegraph lines to transmit visual information was an important precursor to television. It was invented by Henry Sutton in Ballarat in 1885. The Record Changer - The centre spindle designed by Tasmanian Eric Waterworth in 1925 for the 'Salonola' record player was soon adopted for use in record changers throughout the world. Shepherd's Castors - the dome shaped castors invented by George Shepherd in 1946 soon became the world standard. Aerogard Insect Repellent - the essential ingredient in this famous insect repellent was invented by the etymologist Dr Doug Waterhouse at the CSIRO in 1963. He revealed the formula to representatives of the Mortein company who patented it and made substantial returns from the sale of the product. The garage roller door in the form of a rolling overhead metal door was first produced by B&D in 1956 and soon became an icon of Australian suburbia. It is now exported or produced under licence in a number of countries throughout the world. White Hat is still attempting to verify whether this style of door can legitimately be claimed as an Australian invention. Finance, commerce & business Pre-paid Postage - the first system of pre-paid postage was instituted in New South Wales in 1839 Xerox Photocopying - the technology behind xerography was developed at The University of Sydney by Professor O U Von Miller in 1907. Polymer Bank Notes - the Australian-invented technology used in producing polymer bank notes is now licensed in many countries throughout the world. In addition, Australia currently produces bank notes for export to 18 countries. Blast Glass (also known as Stop Shot). A ballistic and blast resistant glass system. Unlike conventional bullet proof glass, it incorporates an air cavity to help absorb the shock waves of explosions. It almost certainly saved many lives in the terrorist bombing of the Australian Embassy in Jakarta in 2004. Invented by Peter Stephenson. Food and drink Refrigeration - The first mechanical refrigeration plant was built in Melbourne by James Harrison in the 1850s. Plaque in Melbourne marking the site of the world's first commercial ice works Vegemite - this peculiarly Australian foodstuff created for waste brewers yeast was invented by Dr Cyril Callister and launched by the food entrepreneur, Fred Walker in 1923. Wine Cask - the flexible bag inside a box was first developed by Thomas Angove of South Australia in 1965 and later given the now familiar tap by Penfolds Wines and brought to market by Sam Wynn of Wynnvale Wines. This design has now become almost universal. Zip Instant Boiling Water Heater - In 1975, engineers at Zip designed and patented the first instant boiling water heater in which the steam is ingeniously recycled to heat the incoming cold water thus creating a highly energy efficient system. Since then Zip water heaters have been exported to large numbers of countries and have become a standard fixture in many staff rooms and catering organisations throughout the world. Social Innovations and "firsts" The Vertically Integrated Migration Service - in the mid 19th century Caroline Chisholm together with her husband set up a private migration support system from the UK to Australia. This included recruitment and education of potential migrants in England and Ireland, preparation and education for their arrival in Australia, overseeing of the humanitarian and health conditions on the transport ships, a loans system to help families establish themselves, and employment and placement services when the migrants arrived in Australia all within a business model that made the operation sustainable. This remarkable achievement would still put to shame the services provided by many governments and wealthy NGOs throughout the world today. The Australian Ballot (Secret Ballot) - the system of casting one's political (or other) vote in a manner that is private and confidential on an anonymous ballot paper. Until the mid 19th century, voting for public office was publicly displayed which left the voter open to intimidation and/or bribery. A secret ballot system was invented by Henry Chapman of Melbourne in 1855 and within a short time of each other in 1856, both the colonies of South Australia and Victoria created a secret ballot system which became known around the world as the Australian Ballot. These Australian colonies were followed at considerable distance by New Zealand in 1870, the UK in 1872, Canada in 1874 and eventually the first presidential election in USA to use Australian Ballot was in 1892. Today the right to a secret ballot as a protection against coercion and intimidation is accepted as a cornerstone for any democratic state or institution. (Note: This should not be confused with representative voting. Where a person has been chosen to represent others - such as in parliament - it is usually regarded that the vote should be visible so as to demonstrate that the representative is truly voting in the manner expected by those who they represent. Also closely related to secret ballot is compulsory voting so that individuals cannot be intimidated into not voting - for instance cultural groups who may wish to deny women the vote by intimidating women to stay away from the voting booths. Compulsory voting has been readily accepted by all but a few Australians who want all of the benefits of a democracy without any of the responsibilities. Australia has been a pioneer in both the areas of secret ballot and compulsory attendance for voting.) Australia has been one of the pioneers of democratic rights. Although Australia was not the first country to have votes for women, it was amongst the first (see this table from the Australian Federal Government web site) and certainly the first to grant women both the right to vote AND the right to sit (first at colony level in South Australia in 1894 then at national level in 1902). Votes for women were granted in South Australia in 1894, Western Australia in 1899, New South Wales in 1902 and Victoria in 1908. The sustained establishment of the Eight Hour Day (or 48 hour working week) was finally achieved in Melbourne in 1856 by a group of skilled tradesmen and small business operators led by James Galloway and James Stephens. This movement was a precursor to the union movement and the condition were later to expand to include both skilled or unskilled employees. Although the 8 hour days had been temporarily achieved in both New Zealand and America at earlier times, they were not sustained, so the Australian movement was seen as a particularly significant since this is where it "took root". The 6 day working week was later reduced to 5 1/2 and by the 1950s had mainly changed to a 5 day week and the standard working week for most employees had reduced to 40 hours. Medical Electronic Pacemaker - the heart pacemaker was developed at Sydney's Crown Street Women's Hospital in 1926 Cochlear Implant in the 1930s Sister Elizabeth Kenny, a bush nurse working in country New South Wales and Queensland, developed a radically new and controversial method of treating children with polio. Her work went on to be internationally acclaimed and is regarded as providing important foundations to the discipline now known as physiotherapy. Penicillin - the life saving application of penicillin was developed by Howard Florey and his team. While penicillin was 'discovered' by Alexander Fleming, it was later isolated by Howard Florey and Ernst Chain at Cambridge and it was Florey and his team who turned it into the practical medication that was used to save millions of lives. Thus there were numbers of important people in the 'invention' of penicillin as we know it. In 1948 Dr John Cade, a Melbourne psychiatrist, discovered the use of lithium carbonate (usually just referred to as lithium) in the treatment of bipolar and similar disorders. Many firsts associated with in vitro fertilisation, including the birth of the first frozen embryo baby at the Queen Victoria Medical Centre in Melbourne 1984. The Bionic Ear - the cochlear implant was invented by a team led by Professor Graeme Clark at The University of Melbourne and in 1978 the first person received the implant at the Royal Victorian Eye and Ear Hospital. The Bionic Ear has brought hearing to more than 50,000 people in over 80 countries. Aspro - Aspro was invented by the chemist, George Nicholas as a form of Aspirin in a tablet. The product was developed in Melbourne between 1915 and 1917, and George's brother Alfred Nicholas together with Henry Woolf Smith were key to its manufacturing and marketing success. By 1940 it had become the world's most widely used headache treatment. Begg Orthodontics - During the 1940s and 1950s Percy Begg of Adelaide developed a system of using relatively cheap and lightweight stainless steel braces on teeth to replace the expensive and painful systems which had been earlier used for 'training' and straightening teeth. Begg's technique soon spread throughout the world. Relenza - The world's first anti-flu drug was developed at several institutions in Victoria and released onto the market in 1996. Spray-on-skin for burns victims developed by Dr Fiona Wood and used to great effect after the 2002 Bali terrorist bombings. Discovery of the Helicobacter pylori bacterium which causes stomach ulcers and gastritis leading to its successful treatment. Barry Marshall and Robin Warren made this discovery in 1982 and received the Nobel Prize in 2005 for their work. The world's first vaccine to prevent cervical cancer with the potential to save hundreds of thousands of lives was developed by Professor Ian Frazer and others at the University of Queensland during the 1990s and eventually approved for use in USA in 2006. The vaccine does not act against cancer but against the virus that causes cervical cancer. It was released onto the market in 2006 under the name Gardasil. General health and well being The Alexander Technique is a set of mental and physical practices developed by F. M. Alexander of Tasmania in the late nineteenth century. It is highly regarded by performing artists for reducing stress and by those suffering back problems. It is now taught in many countries throughout the world. Industry Calyx Drill - developed by Francis Davis around 1893, this drill was used for drilling large holes in rock and was adopted in many countries around the world because it reduced waste and was highly economical. Flotation Process - the froth flotation process used in the separation of minerals from rocks was developed during 1901-1903 by Charles Potter and Guillaume Delprat of New South Wales. Thrust Bearing - the tilt-pad thrust bearing was invented by Anthony Mitchell in 1905. It is regarded as probably the single most important invention in the world of thrust technology. Moldflow software - Between 1970 and 1978 Colin Austin developed software that allowed computer simulation of the injection moulding process. This allowed designers of moulds to eliminate much of the lengthy and costly process of test mould designs by trial and error. Today Moldflow software is used by many leading manufacturing companies throughout the world particularly in the area of aircraft and automotive manufacture.

Australia invents BPAY and BPAY View, the electronic bill payment and presentment systems allowing hassle-free bill payment and electronic bill viewing through the security of Internet or phone banking services.

Arts and entertainment The multi-media entertainment Soldiers of the Cross produced by the Limelight Studio of the Salvation Army Melbourne is regarded as the forerunner of the feature film, and The Story of the Kelly Gang, made in 1906 is regarded as the first feature length film ever made. It ran for more than an hour. Australia can be regarded as the birthplace of the feature film since it continued to produce feature films for another five years before any other country created their own. The History of the Kelly Gang The painter Pro Hart has also been a prolific inventor. The Free Music Machine - an electronic music machine invented by Percy Grainger that was the forerunner of modern synthesizers. The Fairlight CMI (computer music instrument) revolutionised electronic music by the way it manipulated sampled sounds. It remains the basis of most electronically produced music today. It was designed by Peter Vogel & Kim Ryrrie in 1979. The Cineon Digital Film Workstation - a system that takes an image from film, digitally manipulates it and returns it to film - was developed by a group of engineers led by David Mann (whose name appear on the patent) in the Kodak laboratories in Victoria around 1990. Sport Australian Rules Football - Invented in the 1850s (with roots in other games including local Aboriginal ones). In White Hat's opinion the greatest team game in the world. In 1858-9 Tom Wills and others codified the rules and these handwritten rules are reproduced in large format in one of the entry foyers of the MCG. By the time other football styles such as soccer and rugby were codified in their modern form, Australian Rules Football was well established and attracting large crowds to the weekly competition. Callisthenics is a uniquely Australian form of physical culture with a large number of participants. It appears to have originated on the Victorian goldfields and evolved over time to the extent that it was included in estedffods and school curricula and attracted large numbers of participants. It involves elements of gymnastics, dance, performance art and theatre and often involves the use of rods, clubs, hoops and other equipment. The 'Australian Crawl' - the style of 'overarm' or 'freestyle' swimming stroke now familiar in competition swimming. It evolved out of the 'trudgen' stroke adopted by certain swimmers in Sydney in the early 1900s. The new stroke was soon known worldwide as 'the Australian Crawl' and its most famous exponent (and quite possibly the inventor of its characteristic version) was Fanny Durack. The year 1912 saw one of the greatest ever sporting achievements by an Australian. Fanny, using an Australian Crawl was not only the first woman ever to win an Olympic gold medal in swimming, in the process she cut four seconds of the men's world record. The 'Tote' (automatic totalisator) - was invented in 1913 by George Julius. The automatic totalisator records incoming horse racing bets and automatically calculates and adjusts dividends. Race Cam - was created in Australia by the engineer Geoff Healey. The winged keel created by Ben Lexcen was famously used in the Americas Cup. Access Class Dinghies - designed and built in Melbourne and now sailed in 15 countries, the Access Class Dinghies were designed to be easy for anybody to sail. Communication-The Teleprinter - This famous machine for recording telegraph messages onto a paper tape was invented by Donald Murray of Sydney. The Pedal Wireless - The two way radio powered by a pedal-operated generator was invented by Alfred Traeger in 1927 and quickly became the central tool of Royal Flying Doctor Service and distance education in the Australian outback. Scientific Pioneering work in the use of X-ray crystallography by William and Lawrence Bragg in examining crystal structures leading to their winning the Nobel Prize in 1916 for their discoveries. The Atomic Absorption Spectrophotometer - this important scientific analytical instrument was invented by Sir Alan Walsh of the CSIRO in 1952. The Mills Cross - a radiotelescope design consisting of two long ground antennas either in the form of a cross or a T shape was adopted world wide. It was invented by B. Y. Mills at the CSIRO in 1953 Synroc - a synthetic rock designed to 'safely' store high level nuclear waste was invented by Ted Ringwood in 1975. As this process is regarded as working best after the nuclear waste has had a 'cooling down' period of 25-30 years, this invention is likely to more highly recognised in coming decades. Gene Shears - this discovery, central to much biotechnology was made by Wayne Gerlach and Jim Haseloff at the CSIRO in 1986. Appropriate Technology - Often solutions to problems exist but are too expensive or inappropriate for use in remote communities. Australian inventors have come up with simple solutions which are often appropriate in the Australian outback or third world countries. The Coolgardie Safe was invented by A. P. Mc Cormick on the West Australian goldfields in the late 1890s. It is a simple open-mesh food cabinet covered with hessian. The hessian is kept damp by a water tray at the top and the is also sometimes placed on a tray of water to stop access by ants. The latent heat of evaporation keeps the contents cooler than ambient temperature outside the cabinet. This simple cooling cabinet could be (and often still is) improvised out of materials to hand. The Icy Ball Kerosene Refrigerator was invented by Edward Hallstrom in Sydney in 1923 and manufactured and distributed by him. For most in the outback at the time it was the only practical form of refrigeration and certainly an advance on the Coolgardie Safe. Buffalo Fly Trap - In 1991 the CSIRO designed a low-tech walk through tent for cows where brushes removed the damaging and irritating buffalo flies from the animal. The flies become trapped in an upper chamber of the tent where they eventually die. Over time the cows realise the comfort benefits and self-clean by visiting the tent unbidden. Source: www.whitehat.com.au/Australia/Inventions/Inventions. The White Hat website provides comprehensive information about Australian inventions and discoveries, including Nobel Prizewinners, Significant Australians as well as a range of directories and lists.

BPAY.

The way
Australia pays.



TABLE OF CONTENTS

BPAY® up Close	2
BPAY Overview	4
BPAY View® Overview	6
BPAY Membership	7
The BPAY Timeline	8
Case Studies	9
Glossary of Terms	12

BPAY is

a service offered through financial institutions. In 10 years, BPAY has become Australia's most popular bill payment service.



An Australian Invention: Hills Hoist, the rotary washing line with hoist, quickly became and remains a fixture in Australian back yards. The original rotary clothes hoist had been designed by Gilbert Toyne in Geelong in 1912, but Lance Hill of Adelaide further developed the design from 1945 onwards and marketed it under the name of the Hills Hoist. He later added and patented the winding mechanism in 1956.

An Australian Innovation

BPAY up close

The Introduction

As popular as the Hills Hoist, BPAY was launched on November 18, 1997. It is an electronic bill payment service offered by member financial institutions (banks, building societies and credit unions) as a core feature of their Internet and phone banking platforms.

A wholly owned subsidiary of Cardlink Services Limited (CSL) – which is owned by ANZ, Commonwealth Bank, NAB, Westpac, St George and BankWest – BPAY is offered by over 170 financial institutions across Australia, providing consumers with access to an efficient payment service.

More than 15,000 businesses accept BPAY payments from their customers who use the bill payment service because it is the hassle-free, time-saving option to pay bills any time of the day or night, on any day of the year, from anywhere in the world, through the

security of their financial institutions' Internet or phone banking system.

For added convenience, consumers can choose from which of their accounts to make the payment (cheque, savings and for some bills credit and debit card accounts). It can be done immediately or scheduled for a later date.

Continual Growth

In 2006, BPAY was the only payment method that had expanded its number of users, with more than half of all Australian bill payers (56%) having used it. In terms of share of bills, BPAY is Australia's most popular payment method (31%)*.

At a time when 60% of Australian households have Internet access**, BPAY's popularity is driven by online payments, with significant year-on-year growth.

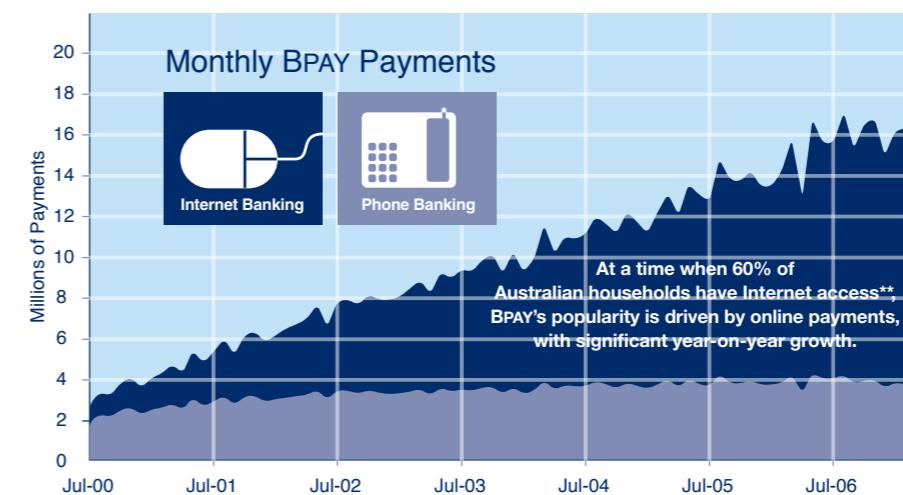
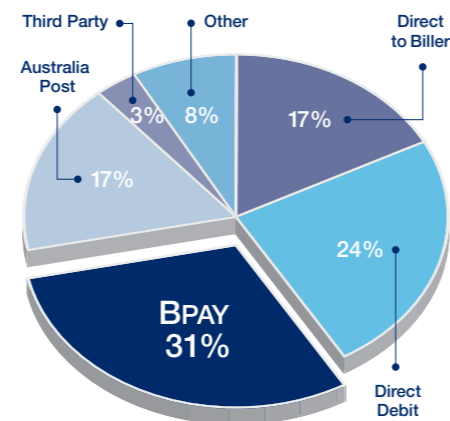
BPAY View

In 2002, BPAY View was launched. The leading consolidated bill presentation and payment service in Australia, it is a natural extension of BPAY,

giving consumers a single point of access to receive, view and pay bills electronically through the security of their Internet banking site.

The continual migration of consumers to broadband has resulted in a critical mass of Australians using the Internet to help organise their bill payment commitments.

Share of bills paid in the last month of 2006



Additionally, heightened concern for the environment means Australian consumers and businesses are looking for 'greener' options. To date, 4,158,829 bills have been presented via BPAY View to 350,000 registered users – equaling approximately 16,635 reams of paper that were not wasted or 1,000 trees that were not cut down. BPAY View also gives businesses a competitive advantage, offering cost efficiencies and a valuable communications channel at a time when tailored client outreach is a critical aspect of any organisation's customer service proposition.

Other Services

BPAY Batch: This service is offered by some financial institutions. Businesses can eliminate manual payment processes by making batch BPAY payments, enabling them to easily and seamlessly deliver multiple payments on behalf of customers. A batch payment is one transaction that consists of numerous payments to various businesses that receive BPAY Payments. A batch payment eliminates the need to write separate cheques or make multiple BPAY payments. A company, for instance a real estate agent who is responsible for

rates and water bills for several properties, simply enters the bill details they wish to pay into one electronic batch file. The bank then accepts the file, processes the individual payments and provides a receipt for each payment.

BPAY Master Biller: A Master Biller acts on behalf of sub-billers by collecting BPAY payments for them. One biller code is issued to the Master Biller for a number of sub-billers of the same type, for instance a franchised business. This arrangement gives smaller businesses that do not have the volume to become a BPAY biller on their own the opportunity to offer the BPAY payment option to their customers.

The Brand

A decade of success means that BPAY's logo is now considered one of the country's most recognised brands, with its characteristically bold 'B' symbolising ease, convenience and security. The 10th anniversary tagline succinctly captures the scheme's achievement: "The Way Australia Pays."



* TNS 2006 BPAY Usage & Attitudes Study ** Australian Bureau of Statistics

BPAY is offered by over 170 financial institutions across Australia.



An Australian Invention: The Two Stroke Lawn Mower, developed in 1952 by Mervyn Victor Richardson, was an immediate success. Richardson set up a family company in 1953, sold 100 mowers in the first year and 60,000 in the fourth.

BPAY Overview

The Basic BPAY Process

1 The Customer ('Payer'):

- Calls their phone banking or logs on to their Internet banking service of their nominated financial institution ('Payer Institution')
- Selects the BPAY feature
- Instructs the Payer Institution to pay a bill by entering the BPAY biller code, customer reference number and dollar amount

- Nominates the account from which they wish to pay

2 The Payer Institution:

- Debits the Payer's account with the amount of the bill(s) to be paid
- Collates the information concerning the bills paid and the amount paid
- Transmits a 'payer details file' to BPAY for processing every banking business day

3 BPAY:

- At the end of the banking business day, processes all 'payer details files'

- Provides a settlement report to BPAY financial institutions

- Executes settlement through existing settlement procedures (direct entry) to reconcile amounts owing between BPAY financial institutions

- Creates and delivers to Biller Institutions their 'biller details file'

4 The Biller Institution:

- Each Biller Institution provides customised data to its billers so that they can update their accounts receivable systems

BPAY Benefits

Business:

- Cleared funds overnight
- Payment information file allows for easy reconciliation
- Improved customer relations by providing choice to consumers

Consumer:

- 24/7 access from anywhere in the world
- No more standing in queues, or writing and mailing cheques
- Security of an online banking environment
- Control over when payments are made
- A choice of how to pay
- A stamped time receipt on every payment

BPAY Fees

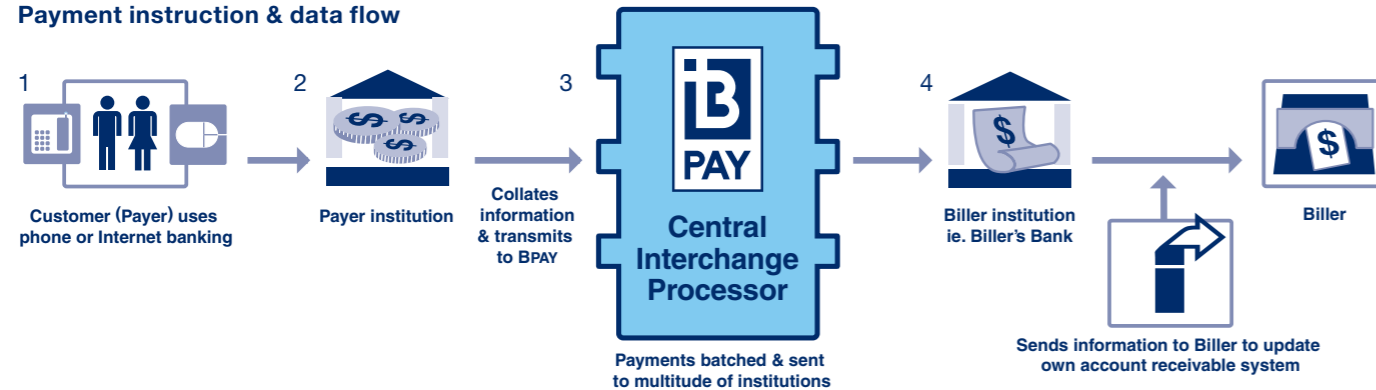
Business:

Transaction fees are agreed between a business that uses BPAY and their bank and are payable to that bank.

Consumer:

A BPAY payment is an electronic transaction undertaken by the consumer at their bank. These electronic transactions may attract fees depending on the individual financial institution offering the BPAY service.

Payment instruction & data flow



"As a business, we are proactively moving towards electronic transactions, and BPAY not only parallels the direction of our business, but is a familiar and easy process for our customers."

GERALD O'SULLIVAN,
GENERAL MANAGER ADMINISTRATION
TNT EXPRESS

"I love BPAY because I can pay bills after hours in the comfort of home especially when I don't have enough hours in the day."

SOURCE:
TNS RESEARCH OCT 07

"We learned that by offering our clients an easy way to pay their invoices, they were more likely to pay them on time."

CHRIS CLARKE,
NATIONAL REVENUE MANAGER,
BOC

Australians

have registered to receive more than 370,000 bills through their internet banking sites via BPAY View.

An Australian Invention: Aspro was invented by the chemist George Nicholas as a form of Aspirin in a tablet. The product was developed in Melbourne between 1915 and 1917, and George's brother Alfred Nicholas – together with Henry Woolf Shmith – were key to its manufacturing and marketing success. By 1940 it had become the world's most widely used headache treatment.

BPAY View Overview

The Basic BPAY View Process

1 The Business:

- As with normal billing cycle, sends through the billing information to its bill service provider (BSP)

2 The BSP:

- Sends the summary bill information to the BPAY View hub

3 The BPAY View Hub:

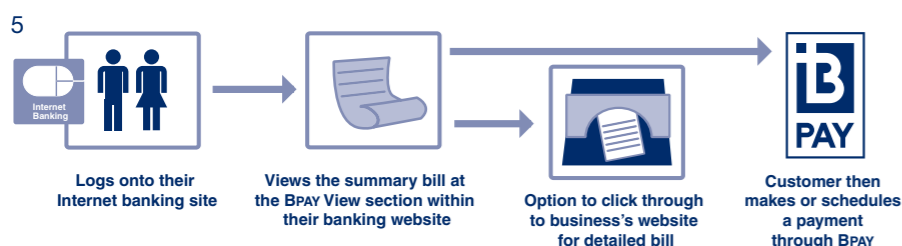
- Forwards this summary bill information to the appropriate financial institution

4 The Financial Institution:

- Alerts its customer that a new bill has arrived at their Internet banking site

5 The Customer:

- Logs onto their Internet banking site
- Views the summary bill at the BPAY View section within the site



- If desired, clicks through to the detailed bill hosted on the businesses site (or the BSP's on behalf of the business)
- Elects to make or schedule a payment through BPAY or any other payment options provided

BPAY View Benefits

Business:

- Provision of bill information via the security of online banking environment
- Access to customers by leveraging the critical mass of online consumer bankers
- Provides a pipeline to the business's website, and an additional marketing channel
- Improved customer relations
- An enabler for better environmental outcomes

Consumer:

- 24/7 access from anywhere in the world
- Secure online banking environment
- One location to view and pay multiple bills
- Ability to access BPAY as payment option
- Electronic storage of bills
- Control over when payments are made
- A 'greener' choice

BPAY View Fee

Business:

Each summary delivered is charged at an agreed fee between the business and their financial institution.

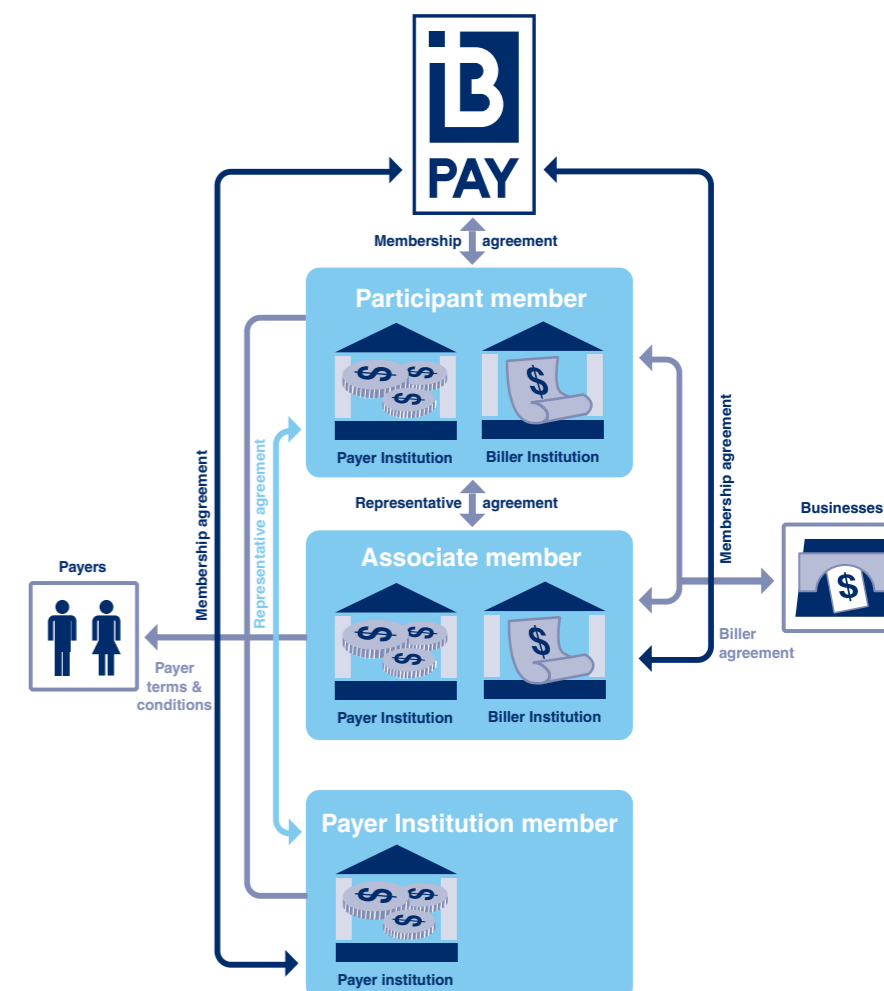
Consumer:

There is no charge for delivering a summary bill to a consumer's Internet banking site.

BPAY Membership

- Participant Member:** An ADI admitted to the BPAY Scheme who directly settles with other Participant Members for inter-institutional settlement payment obligations arising in the Scheme.
 - An Eligible Participant Member has the right to appoint a representative to the Management Committee. The Management Committee is made up of representatives of the top 12 institutions by volume processed.
- Associate Member:** An ADI that is a member of the BPAY Scheme who does not directly settle for inter-institutional settlement obligations arising in the Scheme. Associate Members settle via a Participant Member.
- Payer Institution Member:** An organisation, not necessarily an ADI, who manages stored value accounts for customers e.g. superannuation funds.
 - Payer Institution Members must be sponsored into the Scheme by a Participant Member and cannot be Biller Institutions
 - Payer Institution Members settle via a Participant Member

The various relationships between Members & BPAY



More than 15,000 billers now accept BPAY payments, increasing at an annual rate of 4.5%.



An Australian Invention: The 'Australian Crawl', the style of overarm or freestyle swimming stroke now familiar in competition swimming evolved out of the trudgen stroke adopted by certain Sydney swimmers in the early 1900s. Its most famous exponent and possibly the inventor was Fanny Durack.

General Operational Principles

The BPAY Rules and Procedures include these general requirements** of Members and Businesses:	
Capacity (Members)	Be an authorised deposit taking institution ("ADI") – except for PIMs Indemnify each other Member and BPAY in relation to any loss or damage suffered Comply with the BPAY Rules including direction or notification given by Management Committee Provides Notices and Reporting detailing transaction volumes and other such relevant information and statistics as may be reasonably required
Customer (Members and Businesses)	Members enter into appropriate arrangements with Businesses and Payers Businesses recognise the payment date (as long as it is made by the cut off time on a business banking day) as the value date of the customer's payment Businesses process payments to the customer's account promptly Businesses recognise mistaken payments made by consumers and return funds promptly
Fees and charges (Members)	Prompt payment of scheme fees and charges by members

**These requirements are not exhaustive, the above is a brief summary only.

BPAY Timeline

BPAY	November: BPAY launches	Annual transaction volume exceeds 9 million	70% payments made by phone	Annual transaction value equals \$9 billion	56% of payments via phone	November: BPAY celebrates it's 5th Birthday	January: BPAY internet payments surpass phone payments for the first time	Annual transaction volume exceeds 120 million	Annual transaction value equals \$91 billion	February: A record \$10 billion passes through the scheme	November-December: 10th Birthday celebrations & one billionth payment made
BPAY View						January: BPAY View launches with 4 live billers	15 live billers	November: The 100,000th bill is registered	2,271,500 bills presented	350,000 registered users	26 live billers
Structure	1 employee	2 employees	4 employees					6 employees	8 employees		10 employees
Members	9 financial institutions at launch					185 financial institutions					March: PIMS is introduced
No. of BPAY Billers	35	295	1,028	3,045	4,713	8,772	10,792	12,811	12,930	13,872	15,270
Regulatory						April: EFT code is revised	February: ACCC conducts BPAY Review		June: RBA releases payment systems reform report	EFT code review	RBA Payment system review
Social/ Environmental		16% of Australian households have Internet access			42% of Australian households have the Internet	Average 6 bills per household	53% of Australian households have Internet	Average bills per household 3.1	5.5 million online bankers	60% of Australian households have Internet access	Approximately 1,000 trees saved since the launch of BPAY View
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007

Case Studies

Businesses

AMP: Making a voluntary super contribution can now be done within a few moments, thanks to the almost 200 different super funds offering BPAY as a payment option.

And while making a simple BPAY super payment is particularly convenient around tax time, it is also useful for self employed people who make payments whenever they have additional cash flow, or anyone wanting to make an undeducted super contribution at anytime.

"Once upon a time – not very long ago in fact – there was no other option than writing a cheque, mailing it and having it manually processed at the other end," says BPAY General Manager Andrew Arnott.

"It's now faster than making a cup of tea," he says. "Australians are familiar with BPAY. They're comfortable with it and they don't need training. There are no forms, which means no struggling with paperwork."

As one of 97 super providers adopting BPAY, AMP's Director of Savings & Retirement, Peter Nicholas, says speed, cost and convenience are the reasons why investors are turning to their PC, rather than their chequebook, to make super payments.

"BPAY is one of our fastest growing payment methods," says Nicholas. "We've seen a 40% rise in payments via BPAY over the past 12 months."

"It's no surprise when you consider BPAY is paperless, immediate and available 24/7. The manual process of writing a cheque could mean missing a payment deadline," he said.

TNT: Giving its business customers more payment choices was the primary reason behind TNT Express' decision to offer the BPAY option two years ago.

"As a business, we are pro-actively moving towards electronic transactions, and BPAY not only parallels the direction



Every month, Australians use BPAY to pay approximately 18 million bills, worth more than \$11 billion.

An Australian Invention: Polymer Bank notes were developed in Australia by the CSRIO and the reserve Bank of Australia to make Australia's bank notes more secure against counterfeiting. The Australian-invented technology used in producing polymer bank notes is now licensed in many countries throughout the world. In addition, Australia currently produces bank notes for export to 18 countries.

of our business, but is a familiar and easy process for our customers," says Gerald O'Sullivan, General Manager Administration, TNT Express. In two years, BPAY payments have grown to account for 16% of all TNT Express transactions.

"We are primarily a business-to-business service, and our data indicates that the BPAY option is used most frequently by our small to medium business owners," said Mr O'Sullivan.

"Although commonly seen as a consumer payment option, many companies now offer BPAY on a business-to-business level," said Andrew Arnott, General Manager, BPAY. "We are experiencing significant growth in this area because it makes commercial sense."

"Whether it is a consumer paying a phone bill or a small business paying a courier invoice, BPAY provides customers with a convenient and secure way to pay their bills, and creates a more efficient collection service for billers and financial institutions," states Mr Arnott.

According to Mr O'Sullivan, it just works. "BPAY was simple to implement and worked from day one. BPAY also complements our new eInvoice service."

"And the back office benefits of BPAY means simplified reconciliation," states Mr O'Sullivan. "At TNT Express, BPAY payments are identified by a single unique reference number (URN), which allows us to instantly match up the payment to the invoice. We do not require any additional information."

And while not a primary factor in deciding to offer BPAY, this payment method is in keeping with TNT's global commitment to develop, maintain and practice positive and sustainable environmental policies in every community in which it operates.

BOC: BOC Limited is a member of The Linde Group, a world-leading industrial gases and engineering company. For more than a century, BOC's gases and expertise have contributed to advances in many industries and aspects of everyday life, including steel-making, refining, chemical processing, environmental protection, wastewater treatment, welding and cutting, food processing and distribution, glass production, electronics and health care.

As the industry leader, its clients include a diverse range of large corporate companies, as well as smaller enterprises and individuals.

In 1998, only one year following the launch of BPAY, BOC began offering this bill payment service to its clients. Viewed as an emerging trend, Internet bill payment gave a large segment of its customer base – small & medium enterprises – a simplified way to pay invoices.

BPAY is now one of the most popular bill payment methods for this segment of BOC's client base, growing at a rate of 13% annually.

From BOC's perspective, BPAY offers both cost and time-savings in relation to its reconciliation process. For its clients, it provides a flexible payment method that operates within a secure environment – an Internet banking site.

"We learned that by offering our clients an easy way to pay their invoices, they were more likely to pay them on time," said Chris Clarke, National Revenue Manager, BOC. "The lack of customer feedback regarding BPAY is a good sign. It tells us that it just works."

Building on the BOC proposition of 'providing customers with ease of doing business', the company began offering BPAY View in mid 2007. A natural extension of BPAY, BPAY View is the leading bill presentment and payment service in Australia.

"The introduction of BPAY View fits into the larger framework of BOC's commitment to corporate responsibility," says Clarke.

"We placed fifth in the 2006 CRI Australian corporate responsibility index, and that is because we are continually looking for ways to lead the industry in this area."

BOC's target with BPAY View is again the SME sector. "Our goal is to have 3% of our clients receiving their invoices online within a year. In three years, we are aiming for a figure of 7.5%, in addition to converting existing BPAY users," said Clarke.

"Again, for BPAY View there is the ease of business for our customers, and the cost and time-savings from our perspective," said Clarke. "And the cost savings extends beyond back office administration to the paper, printing and postage saved from not delivering paper bills."

Consumers

First-time mother Deb Phyland has had to change a few things in her life since the arrival of her daughter Jorja.

"I just don't have time to waste anymore," says Phyland. With the round-the-clock schedule of a young baby, Phyland's day requires flexibility and convenience.

"My husband works full-time in a very busy role, so I take care of the family's household administration," says Phyland. "But standing in a line to pay bills is simply not an option."

With the convenience of accessing BPAY any time of the day or night and the ability to pay all the household bills and invoices in minutes, Phyland can remain in control of her household's finances. Phyland pays on average nine bills a month by logging onto her bank's Internet banking site to access BPAY. She says the most unusual bill she has ever paid with BPAY would have to be the dog registration notice – which she paid at three in the morning.

"I also like that I can choose from which of my bank accounts to make the payment, and that I can make a payment immediately or schedule it for a later date," says Phyland. "It gives me peace-of-mind to know that these payments are being made through my bank, not a third party."

For early IT adopter Matt Longbottom, the Internet serves as an essential lifestyle tool for everything from checking sports scores and current news headlines to general research such as vacation planning.

Not surprisingly, Longbottom has been a BPAY Internet user since the company's inception in 1997.

"For me, BPAY's primary benefit is the ease of management and the flexibility that the service provides," says Longbottom. "I am able to pay bills and manage my accounts at my leisure without being hamstrung by business hours or having to waste time waiting in line to pay a bill."

Longbottom pays on average six bills a month by logging onto his bank's Internet site to access BPAY, paying bills such as rates and utilities.

"BPAY allows me to see all my financial details in one place, making money management much simpler," said Longbottom. "Depending on the bill and the amount, I make some payments instantly and others are scheduled for a specific day later in the month." With the convenience and flexibility of accessing BPAY any time of the day or night and the ability to pay all his bills in minutes, Longbottom can remain in control of his personal finances and save time.

The success of BPAY is two-fold: offering consumers a convenient and secure way to pay their bills; and businesses and financial institutions a more efficient bill collection service.

Glossary of Terms

Authorised Deposit Taking

Institution (ADI): Corporations that are authorised to take deposits under the Banking Act 1959, including banks, building societies and credit unions.

Biller: The organisation that has issued a bill for payment, for instance an energy company or a local council.

Biller Code: A unique BPAY number assigned to a specific billing organisation.

Biller Institution: A biller's nominated financial institution.

Biller Service Provider (BSP): The organisation that processes billing information on behalf of a biller.

BPAY Rules and Operating

Procedures (BROP): The framework of guidelines and requirements under which all BPAY members must function.

Capture Reimbursement Fee (CRF): A wholesale fee set by the BPAY Scheme for all BPAY payments, which is paid as a reimbursement for the costs incurred by the bill payer's

financial institution in capturing and processing bill payment instructions on behalf of the biller's financial institution. This fee is paid by the biller's financial institution to the bill payer's financial institution.

Central Interchange Processor

(CIP): The organisation that conducts the backend processing for a BPAY payment – Cardlink Services currently acts as the BPAY CIP.

Customer Reference Number

(CRN): A unique BPAY number displayed on a biller's invoice that identifies the payer.

Electronic Funds Transfer Code of

Conduct (EFT Code): A set of rules and procedures, regulated by the Australian Securities and Investments Commission (ASIC), that protects consumers when using electronic funds transfers.

'On-U's' Transactions: A payment that is made where the biller institution is the same as a payer institution, so the payment information does not need to go through the CIP for processing settlement.

Payer: The entity – either an individual or organisation – paying the bill.

Payer Institution: The payer's nominated financial institution.

Payer Institution Member (PIM): A new BPAY member class that is not necessarily an ADI, e.g. church development funds, mortgage trusts or any other entity that maintains value accounts for customers.

Contact Information

Learn more: For a full list of the features and benefits of BPAY and BPAY View, log onto www.bpay.com.au

Become a BPAY biller: To find out what is involved in becoming a BPAY or BPAY View biller, please contact your financial institution.

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