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**power to the people:
DIY tools made easier for all**



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Research partner:

B&Q plc

Year of completion: 2001

introduction

A design study to develop new mainstream products for the B&Q power tools range to include the needs of older users and those with reduced grip. The market focus of the project is DIY and home improvement for active, retired people rather than products for professionals or for the building site. Can special needs be included in products that have broader appeal than special needs equipment?

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challenge

DIY is a very popular activity - especially amongst those of retirement age with more time on their hands. But power tools, essential to many basic home improvement tasks, are almost always designed without taking into account the physical impairments that can result from ageing.

As we grow older, our eyesight deteriorates, our strength decreases and our dexterity is reduced. Tools are usually designed for able bodied workmen and industrial processes - emphasis is placed on purpose rather than ease of use or aesthetic. In particular, power tools are designed for physically strong users, with no attention paid to the growing domestic market of older people.

The challenge is to explore ways in which manufacturers, retailers and designers can be persuaded to take the needs of the older consumer more seriously. Is the answer to produce a range of 'special needs' equipment or can the needs of older people be successfully written into the design brief of mainstream products?



A retired carpenter works in his shed: key user in the study



Many tools are difficult for older people to use



the helen hamlyn
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research partner

B&Q is the UK's largest home improvement retailer with 309 stores and over 28,000 staff. Established for over 30 years, the company is known for its wide ranges of products, good value for money and a series of policies ranging from employing older people to serving disabled customers and leading on environmental issues.



A key objective for B&Q was to create better designed, own brand products that fully explore the potential for a 'Design for Life' brand. The company was keen to embody its inclusive attitude within a range of products on sale in its stores.

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methodology

The Research Associate first consulted with B&Q to set the project within the company vision. In-store interviews with customers and staff were followed by an extensive product audit supported by desk research and competitor evaluation. From this, key design issues and in the area of power tools were identified for further development.

Three different timescales of user testing were used throughout the project. Long term user testing lasting up to eight months allowed detailed evaluation of existing tools and documentation of issues to be written into the design process. Nine users ranging from a retired carpenter to a businesswoman were selected and given a range of tools and tasks to evaluate confirm and reject ideas.

A range of users were asked to perform specific DIY tasks with various tools, then informally discuss the process and give feedback on test concepts and prototypes.

Focus groups of five older people, lasting about two hours, were conducted during the most intense concept creation stage. Simple product feedback and hands-on prototype evaluation were measured both quantitatively and qualitatively.



Long term user testing with a sander



User preferences were analysed in reports to aid B&Q suppliers



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results

There were four design outputs. The cordless screwdriver is one of the most popular power tools yet current tools are long, unwieldy and difficult to grip and activate. A redesign made the shape easier to fit into the palm of the hand and the screwdriver is automatically activated as soon as the screw bit pushed into the screw.

Cordless drills are heavy to use due to the battery weight. By attaching the battery via belt clip to the waist and connecting it to the drill with a short power cord, the freedom of cordless drills could be kept whilst relieving battery weight.

The reciprocating jigsaw has become a best selling product but little attention has been paid to the ergonomics of holding the saw whilst applying force. By changing the angle of application and totally redesigning the handle and battery case, a unique and new type of power saw was created.

The final concept looked at the popular palm-sized sander which is generally uncomfortable to hold, as the user is expected to press and hold it against a surface whilst it vibrates gently to re-create a sanding motion. The prototype was redesigned to fit the 'cup' of the hand whilst a hand strap removes the need to firmly grip it.



Cordless screwdriver with easy-to-grip shape



Cordless drill: reducing weight



Reciprocating saw: ergonomic rethink



Palm-sized sander: hand strap innovation

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issues

Key to the results of this project was interpretation of the results gathered through user testing. Numerical evaluation using test rigs provided precise quantitative results, but conversational interviews provided equally important qualitative information on consumer attitude and preference. Observation of users performing tasks was also important. Many problems were to do with users performing secondary tasks such as battery changing or accessing the carrying case for the tools - aspects people generally left out of their formal reports.

The study showed that correctly incorporating user need and feedback into the design process can create a better product. And when those users have special needs such as reduced dexterity or arthritis, addressing their needs in a mainstream product design brief can provide innovative triggers as well. A power tool that is designed to be easier to hold, will be easier to hold for everyone who uses it - not just retired people.

Can listening to users help designers and manufacturers approach newly created markets in a fresh, rather than conventional manner? B&Q thinks so. It subsequently developed two of the concepts - the cordless screwdriver and palm-sized sander - into full production models for launch onto the market in autumn 2002.



[view larger image](#)



User feedback influenced the configuration of the new tools, acting as an innovation trigger



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projects

brief 1

- 1/ Look at one type of power tool (e.g. drill, sander, jigsaw, heat gun).
- 2/ If money, resources, materials etc. were no object, redesign the tool for optimum performance for a) you b) your mother c) your grandfather d) someone with one arm.
- 3/ Take some of the design proposals from your 'fantasy tool' and make them more 'real world' in that the product could be sold in a DIY store.
- 4/ Suggest some packaging concepts to brand and sell your tool off the shelf.

brief 2

- 1/ Look at one appliance in the domestic market (eg fan, toaster or food mixer etc) and one power tool.
- 2/ Document the differences between them (look, feel, material, size, weight, power requirements, ease of operation).
- 3/ Take your documented domestic appliance and power tool and create the profile of a character who might use them (include name, age, favourite food, job, type of person, where they live etc).

brief 3

- 1/ Look at one type of power tool from different manufacturers in the same price band.
- 2/ Document differences and similarities (weight, colour, button operation, features).
- 3/ Suggest some improvements that would make the power tool suitable for: a) you b) builders c) older DIY enthusiasts d) someone with one arm e) someone with a visual impairment.

brief 4

- 1/ Find out more about what happens to the body as it ages. Look especially at eyesight and strength reduction in hands and arms.
- 2/ Based on the above, carry out a product audit of five different power tools in your local DIY store. Document how suitable they are for the older market.
- 3/ Suggest some improvements that would make them suitable for older DIY enthusiasts. Look at whether these improvements would be also better for you.