Purposeful Design

28th September 2017

Nishant Bhaskar

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Purposeful Design: Elements, Form & Interactions

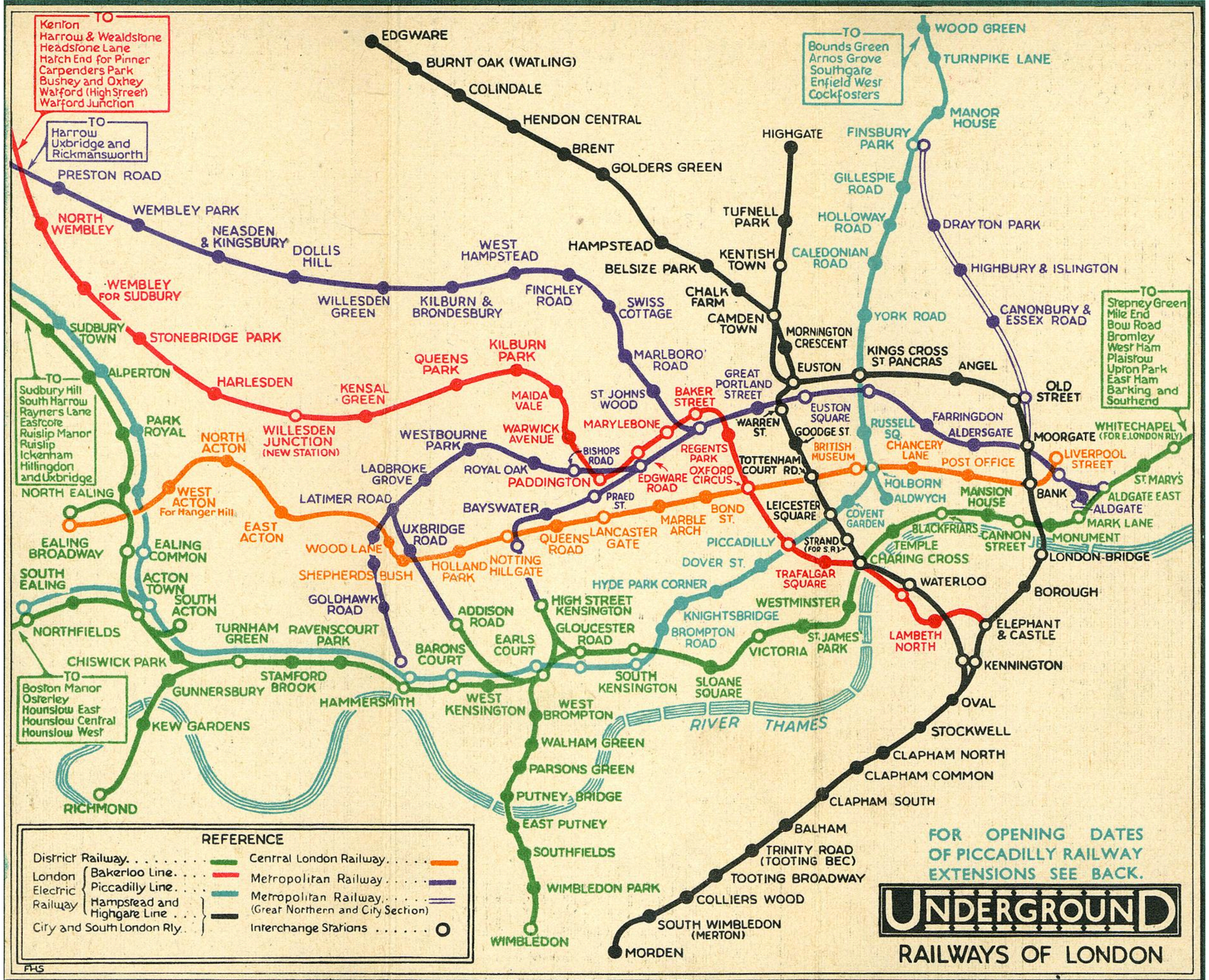

AMCREST

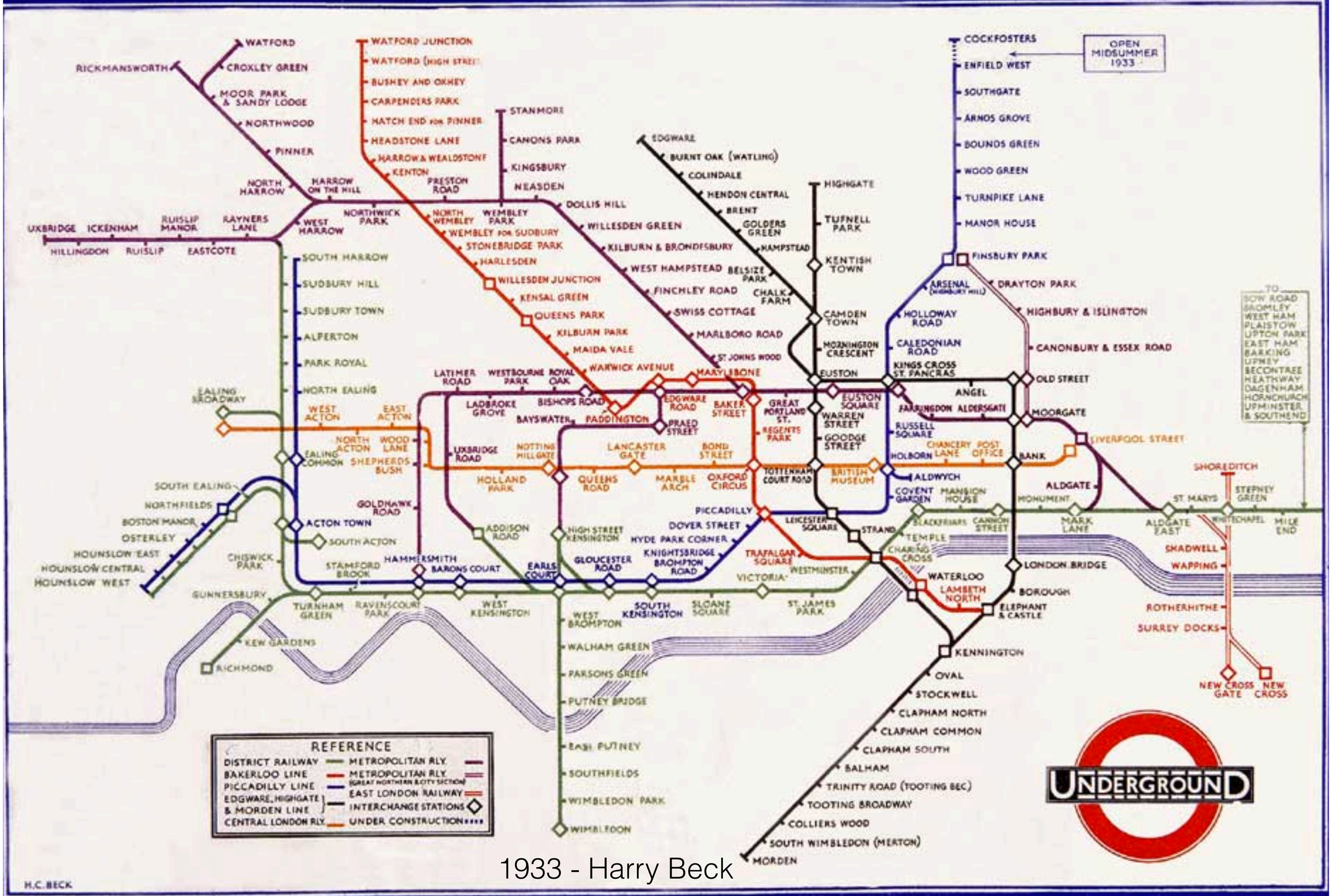
Godrej | SECURITY SOLUTIONS

EVE HOME CAMS

http://www.newindianexpress.com/business/2017/aug/30/godrej-launches-wifi-enabled-cctv-1650003.html


Cricklewood
Hampstead
Hampstead Heath
Gospel Oak
Holloway
Arsenal
Dollis Hill
Willesden Green
West Hampstead
Finchley Road & Frognal
Kilburn
Belsize Park
Kentish Town
Kentish Town West
Holloway Road
Drayton Park
Canonbury
Dalston Kingsland
Hackney Downs
Homerton
HACKNEY
Leyton
Stratford International
Maryland
Finchley Road
Chalk Farm
Swiss Cottage
Camden Road
Caledonian Road
Highbury & Islington
Dalston Junction
Hackney Central
Hackney Wick
Stratford
Brondesbury Park
Brondesbury
Kilburn High Road
Camden Town
Caledonian Road & Barnsbury
Essex Road
A10
A106
Victoria Park
Stratford High Street
Kensal Rise
Queen's Park
South Hampstead
St. John's Wood
Mornington Crescent
St. Pancras International
King's Cross
Angel
A1200
Haggerston
London Fields
Cambridge Heath
Bethnal Green
A1205
Pudding Mill Lane
West Ham
Abbey Road
Kensal Green
Kilburn Park
Maida Vale
A5
Regent's Park
Hoxton
A1208
Mile End
Bow Church
Bow Road
WESTMINSTER
Warwick Avenue
Baker Street
Great Portland Street
Euston
King's Cross St. Pancras
Old Street
Shoreditch High Street
Bethnal Green
Marylebone
Edgware Road
Euston Square
Russell Square
Farringdon
Moorgate
Liverpool Street
Whitechapel
Stepney Green
Devons Road
Bromley-by-Bow
Royal Oak
Regent's Park
Warren Street
Goodge Street
Tottenham Court Road
Barbican
Aldgate East
A13
TOWER HAMLETS
Edgware Road
Bond Street
Oxford Circus
Holborn
Chancery Lane
St. Paul's
Aldgate
Langdon Park
Westbourne Park
Bayswater
Paddington
Ladbroke Grove
Marble Arch
Leicester Square
Covent Garden
City Thameslink
Mansion House
Fenchurch St.
Tower Hill
Shadwell
Limehouse
Poplar
All Saints
Westferry
Latimer Road
Lancaster Gate
Temple
Charing Cross
Blackfriars
Cannon Street
Tower Gateway
A1203
Blackwall
East India
West India Quay
White City
Wood Lane
Queensway
Notting Hill Gate
Hyde Park
Kensington Gardens
Green Park
Piccadilly Circus
Embankment
Monument
Canary Wharf
Heron Quays
Shepherd's Bush Market
Holland Park
Shepherd's Bush
Waterloo East
Westminster
London Bridge
Wapping
A100
A200
Goldhawk Road
High Street Kensington
A315
Knightsbridge
Hyde Park Corner
Southwark
Rotherhithe
South Quay
A1206
Kensington (Olympia)
A4
Waterloo
Lambeth North
St. James's Park
Borough
Canada Water
Bermondsey
Crossharbour
Gloucester Road
Sloane Square
Victoria
Elephant & Castle
Surrey Quays
Hammersmith
Earl's Court
South Kensington
Barons Court
Ravenscourt Park
KENSINGTON AND CHELSEA
Kennington
Mudchute
Island Gardens
West Kensington
West Brompton
Pimlico
South Bermondsey
Cutty Sark for Maritime Greenwich
Maze Hill
Vauxhall
Nine Elms
Battersea
Battersea Park
River Thames
Oval
A3
A215
A2
Deptford
Greenwich
Fulham Broadway
A3220
A306
A219
Queenstown Road
A202
Queens Road Peckham
New Cross
New Cross Gate
Deptford Bridge
Parsons Green
Imperial Wharf
Stockwell
A23
Denmark Hill
Peckham Rye
Elverson Road
A2
Putney Bridge
Clapham Junction
Loughborough Junction
Nunhead
St. Johns
Lewisham
Wandsworth Road
Clapham North
Brixton
Brockley
Clapham High Street


TO
Kenton
Harrow & Wealdstone
Headstone Lane
Hatch End for Pinner
Carpenders Park
Bushey and Oxhey
Watford (High Street)
Watford Junction
TO
Harrow
Uxbridge and
Rickmansworth
TO
Sudbury Hill
South Harrow
Rayners Lane
Eastcote
Ruislip Manor
Ruislip
Ickenham
Hillingdon
and Uxbridge
TO
Boston Manor
Osterley
Hounslow East
Hounslow Central
Hounslow West
TO
Bounds Green
Arnos Grove
Southgate
Enfield West
Cockfosters
TO
Stepney Green
Mile End
Bow Road
Bromley
West Ham
Plaistow
Upton Park
East Ham
Barking and
Southend
EDGWARE
BURNT OAK (WATLING)
COLINDALE
HENDON CENTRAL
BRENT
GOLDERS GREEN
HIGHGATE
WOOD GREEN
TURNPIKE LANE
MANOR HOUSE
FINSBURY PARK
GILLESPIE ROAD
HOLLOWAY ROAD
DRAYTON PARK
HIGHBURY & ISLINGTON
CALEDONIAN ROAD
TUFNELL PARK
KENTISH TOWN
HAMPSTEAD
BELSIZE PARK
CHALK FARM
CAMDEN TOWN
YORK ROAD
CANONBURY & ESSEX ROAD
PRESTON ROAD
WEMBLEY PARK
NORTH WEMBLEY
NEASDEN & KINGSBURY
DOLLIS HILL
WEST HAMPSTEAD
WEMBLEY FOR SUDBURY
WILLESDEN GREEN
KILBURN & BRONDESBURY
FINCHLEY ROAD
SWISS COTTAGE
MARLBORO' ROAD
MORNINGTON CRESCENT
KINGS CROSS ST PANCRAS
ANGEL
OLD STREET
SUDBURY TOWN
STONEBRIDGE PARK
ALPERTON
HARLESDEN
KENSAL GREEN
QUEENS PARK
KILBURN PARK
MAIDA VALE
ST JOHNS WOOD
BAKER STREET
GREAT PORTLAND STREET
EUSTON
EUSTON SQUARE
GOODGE ST
WARREN ST.
RUSSELL SQ.
FARRINGDON
ALDERSGATE
MOORGATE
WHITECHAPEL (FOR E.LONDON RLY)
LIVERPOOL STREET
ST. MARY'S
ALDGATE EAST
ALDGATE
MARK LANE
MONUMENT
LONDON-BRIDGE
BOROUGH
PARK ROYAL
NORTH ACTON
WILLESDEN JUNCTION (NEW STATION)
WESTBOURNE PARK
WARWICK AVENUE
MARYLEBONE
BISHOPS ROAD
REGENTS PARK
BRITISH MUSEUM
CHANCERY LANE
POST OFFICE
TOTTENHAM COURT RD.
LADBROKE GROVE
ROYAL OAK
PADDINGTON
EDGWARE ROAD
OXFORD CIRCUS
HOLBORN
ALDWYCH
MANSION HOUSE
BANK
NORTH EALING
WEST ACTON
For Hanger Hill
LATIMER ROAD
PRAED ST.
BAYSWATER
LEICESTER SQUARE
COVENT GARDEN
BLACKFRIARS
CANNON STREET
EAST ACTON
UXBRIDGE ROAD
MARBLE ARCH
BOND ST.
QUEENS ROAD
LANCASTER GATE
PICCADILLY
STRAND (FOR S.R.)
TEMPLE
CHARING CROSS
EALING BROADWAY
EALING COMMON
WOOD LANE
HOLLAND PARK
NOTTING HILL GATE
DOVER ST.
SOUTH EALING
ACTON TOWN
SOUTH ACTON
SHEPHERDS BUSH
TRAFALGAR SQUARE
WATERLOO
GOLDHAWK ROAD
HYDE PARK CORNER
HIGH STREET KENSINGTON
WESTMINSTER
ADDISON ROAD
KNIGHTSBRIDGE
ELEPHANT & CASTLE
NORTHFIELDS
TURNHAM GREEN
RAVENSCOURT PARK
EARLS COURT
GLOUCESTER ROAD
BROMPTON ROAD
ST. JAMES' PARK
VICTORIA
LAMBETH NORTH
CHISWICK PARK
BARONS COURT
KENNINGTON
STAMFORD BROOK
SOUTH KENSINGTON
SLOANE SQUARE
GUNNERSBURY
HAMMERSMITH
WEST KENSINGTON
WEST BROMPTON
OVAL
KEW GARDENS
RIVER THAMES
STOCKWELL
WALHAM GREEN
CLAPHAM NORTH
PARSONS GREEN
CLAPHAM COMMON
PUTNEY BRIDGE
CLAPHAM SOUTH
EAST PUTNEY
BALHAM
SOUTHFIELDS
TRINITY ROAD (TOOTING BEC)
WIMBLEDON PARK
TOOTING BROADWAY
COLLIERS WOOD
RICHMOND
WIMBLEDON
SOUTH WIMBLEDON (MERTON)
MORDEN
REFERENCE
District Railway
London Electric Railway: Bakerloo Line, Piccadilly Line, Hampstead and Highgate Line
City and South London Rly.
Central London Railway
Metropolitan Railway
Metropolitan Railway (Great Northern and City Section)
Interchange Stations
FOR OPENING DATES OF PICCADILLY RAILWAY EXTENSIONS SEE BACK.
UNDERGROUND
RAILWAYS OF LONDON
FHS



1933 - Harry Beck


Chesham
Chalfont & Latimer
Amersham
Chorleywood
Rickmansworth
Watford
Croxley
Moor Park
Northwood
Northwood Hills
Pinner
North Harrow
Harrow-on-the-Hill
West Harrow
Watford Junction
Watford High Street
Bushey
Carpenders Park
Hatch End
Headstone Lane
Harrow & Wealdstone
Kenton
Preston Road
West Ruislip
Hillingdon
Uxbridge
Ickenham
Ruislip
Ruislip Manor
Eastcote
Ruislip Gardens
South Ruislip
Northolt
Greenford
Rayners Lane
South Harrow
Sudbury Hill
Sudbury Town
Alperton
Perivale
Hanger Lane
Park Royal
North Ealing
Ealing Broadway
West Acton
North Acton
East Acton
White City
Wood Lane
Shepherd's Bush
Shepherd's Bush Market
Holland Park
Acton Central
South Acton
Ealing Common
Acton Town
South Ealing
Northfields
Boston Manor
Osterley
Hounslow East
Hounslow Central
Hounslow West
Hatton Cross
Heathrow Terminals 1, 2, 3
Heathrow Terminal 4
Heathrow Terminal 5
Chiswick Park
Turnham Green
Stamford Brook
Ravenscourt Park
Gunnersbury
Kew Gardens
Richmond
Kensington (Olympia)
Barons Court
Hammersmith
West Brompton
Fulham Broadway
Parsons Green
Putney Bridge
East Putney
Southfields
Wimbledon Park
Wimbledon
West Kensington
Earl's Court
Goldhawk Road
Shepherd's Bush
Wood Lane
Stanmore
Canons Park
Queensbury
Kingsbury
Neasden
Dollis Hill
Willesden Green
Kilburn
West Hampstead
Finchley Road
Swiss Cottage
St. John's Wood
Willesden Junction
Harlesden
Stonebridge Park
Wembley Central
North Wembley
South Kenton
Kenton
Wembley Park
Northwick Park
Kensal Rise
Kensal Green
Queen's Park
Brondesbury Park
Brondesbury
Kilburn High Road
South Hampstead
Kilburn Park
Maida Vale
Warwick Avenue
Paddington
Edgware Road
Marylebone
Royal Oak
Westbourne Park
Ladbroke Grove
Latimer Road
Bayswater
Notting Hill Gate
Lancaster Gate
Queensway
High Street Kensington
Gloucester Road
Bond Street
Marble Arch
Oxford Circus
Regent's Park
Great Portland Street
Baker Street
Warren Street
Euston
Euston Square
Goodge Street
Tottenham Court Road
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Covent Garden
Leicester Square
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Victoria
Westminster
Embankment
Temple
Blackfriars
Cannon Street
Mansion House
Monument
Tower Hill
Fenchurch Street
Tower Gateway
Bank
St. Paul's
Aldgate
Aldgate East
Liverpool Street
Moorgate
Barbican
Farringdon
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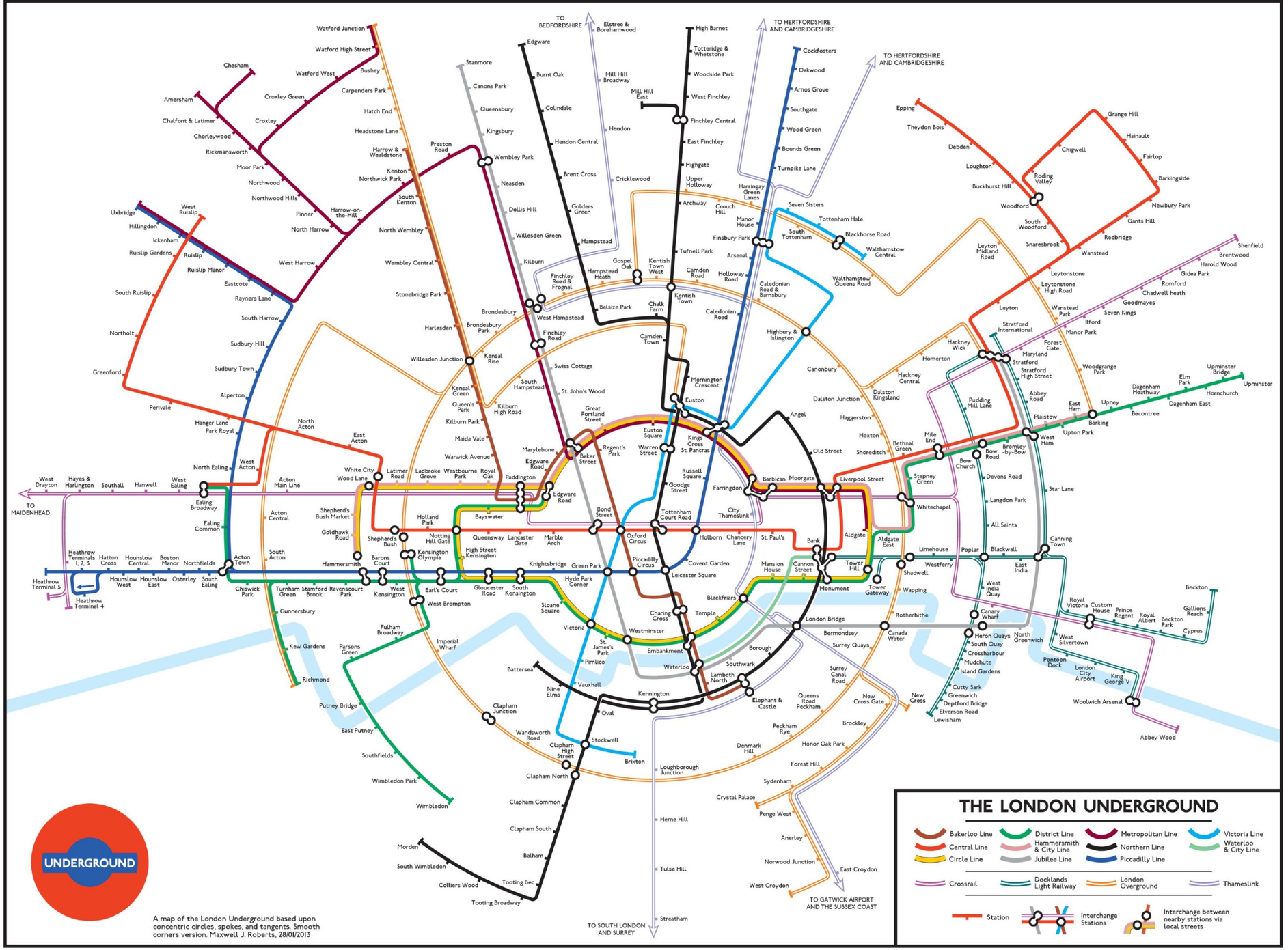
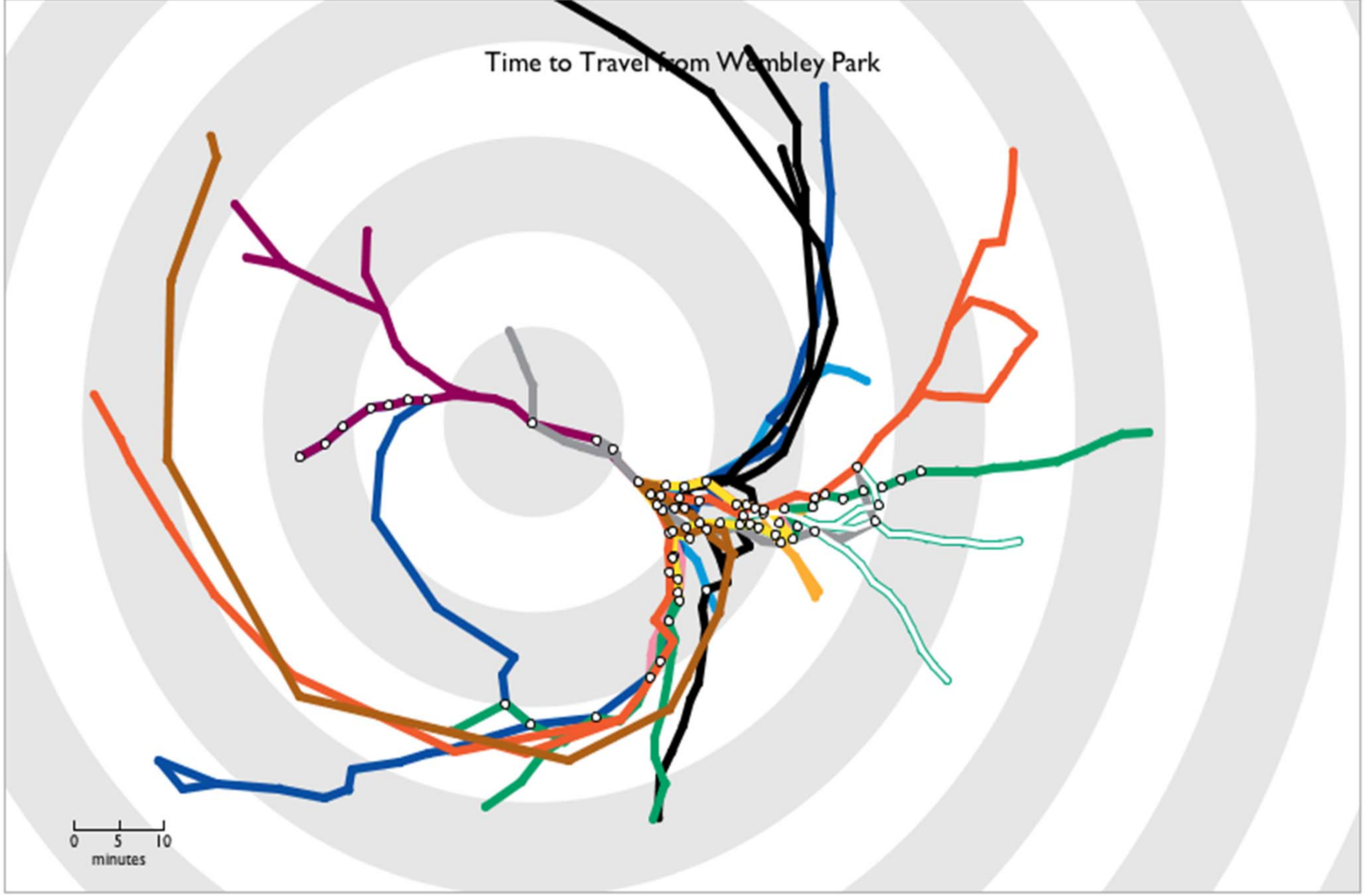
King's Cross St. Pancras
Mornington Crescent
Camden Town
Chalk Farm
Belsize Park
Hampstead
Hampstead Heath
Finchley Road & Frognal
Edgware
Burnt Oak
Colindale
Hendon Central
Brent Cross
Golders Green
Gospel Oak
Kentish Town West
Kentish Town
Camden Road
Caledonian Road
Caledonian Road & Barnsbury
Holloway Road
Arsenal
Highbury & Islington
Upper Holloway
Crouch Hill
Finsbury Park
Manor House
Turnpike Lane
Harringay Green Lanes
Seven Sisters
Tottenham Hale
South Tottenham
Blackhorse Road
Walthamstow Central
Walthamstow Queen's Road
Leyton
Leyton Midland Road
Leytonstone
Leytonstone High Road
Wanstead
Gants Hill
Wanstead Park
Woodgrange Park
Stratford
Stratford International
Stratford High Street
Abbey Road
Pudding Mill Lane
Bow Road
Bow Church
Mile End
Bethnal Green
Hackney Central
Hackney Wick
Homerton
Dalston Junction
Dalston Kingsland
Canonbury
Haggerston
Hoxton
Shoreditch High Street
Whitechapel
Stepney Green
Devons Road
Langdon Park
All Saints
Bromley-by-Bow
West Ham
Star Lane
Plaistow
Upton Park
East Ham
Barking
Upney
Becontree
Dagenham Heathway
Dagenham East
Elm Park
Hornchurch
Upminster Bridge
Upminster
Shadwell
Westferry
Poplar
East India
Limehouse
Wapping
Blackwall
West India Quay
Canary Wharf
Heron Quays
South Quay
Crossharbour
Mudchute
Island Gardens
Canning Town
Royal Victoria
Custom House for ExCeL
Emirates Royal Docks
Prince Regent
Royal Albert
Beckton Park
Cyprus
Gallions Reach
Beckton
West Silvertown
Pontoon Dock
London City Airport
King George V
Woolwich Arsenal
Cutty Sark for Maritime Greenwich
Greenwich
Deptford Bridge
Elverson Road
Lewisham
North Greenwich for The O2
Emirates Greenwich Peninsula
Rotherhithe
Canada Water
Surrey Quays
New Cross
New Cross Gate
Brockley
Honor Oak Park
Forest Hill
Sydenham
Penge West
Anerley
Norwood Junction
West Croydon
Crystal Palace
Queens Road Peckham
Peckham Rye
Denmark Hill
Brixton
Elephant & Castle
Borough
Southwark
Lambeth North
Waterloo
Vauxhall
Pimlico
Oval
Kennington
Stockwell
Clapham Junction
Wandsworth Road
Clapham High Street
Clapham North
Clapham Common
Clapham South
Balham
Tooting Bec
Tooting Broadway
Colliers Wood
South Wimbledon
Morden
Imperial Wharf
River Thames
London Bridge
Bermondsey
Tottenham Hale
High Barnet
Totteridge & Whetstone
Woodside Park
West Finchley
Finchley Central
East Finchley
Highgate
Archway
Tufnell Park
Mill Hill East
Cockfosters
Oakwood
Southgate
Arnos Grove
Bounds Green
Wood Green
Theydon Bois
Debden
Loughton
Buckhurst Hill
Epping
Roding Valley
Chigwell
Grange Hill
Hainault
Fairlop
Barkingside
Newbury Park
Redbridge
Woodford
South Woodford
Snaresbrook
Leytonstone
Legend
Bakerloo
Central
Circle
District
District open weekends, public holidays and some Olympia events
Hammersmith & City
Jubilee
Metropolitan
Northern
Piccadilly
Victoria
Waterloo & City
DLR
London Overground
Emirates Air Line
Interchange stations
Step-free access from street to train
Step-free access from street to platform
National Rail
Riverboat services
Tramlink
Airport
Emirates Air Line

What could the next evolution of metro map look like?



https://www.youtube.com/watch?v=bjPZSmDAyyM


Time to Travel from Wembley Park
0
5
10
minutes

1937 - Henry Dreyfuss

2017 - Tesla

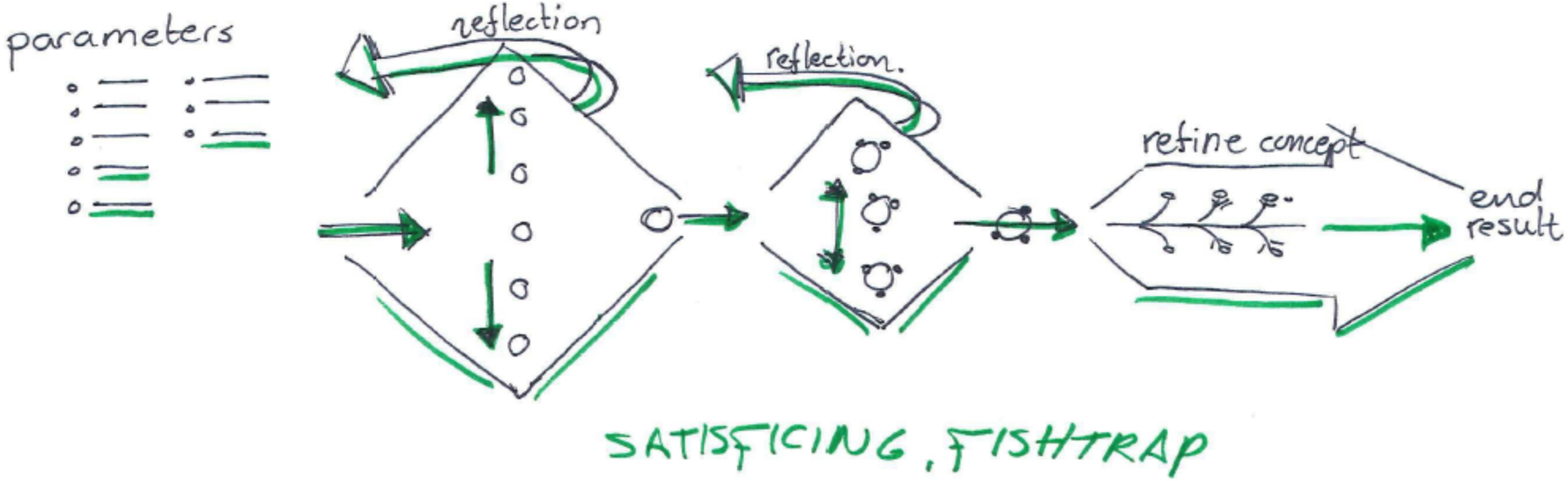
Please enjoy Slack responsibly.

– Your friends at Slack

https://www.youtube.com/watch?v=B6zVzWU95Sw

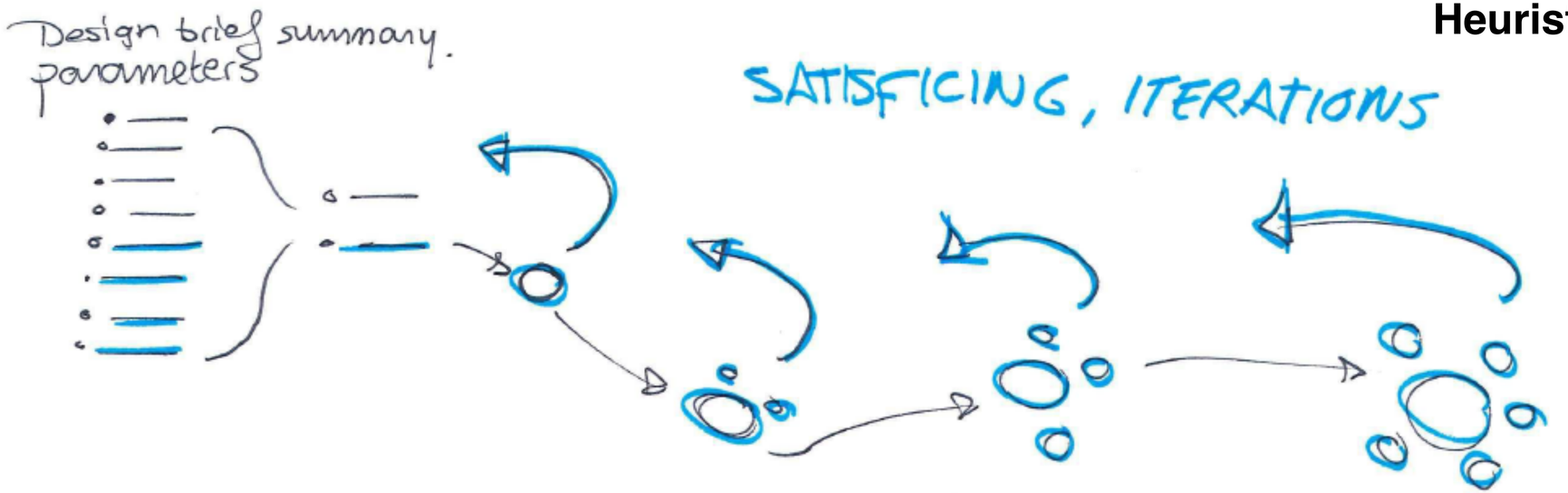
Approaches to Designing

Design an insulin pump to be used by children

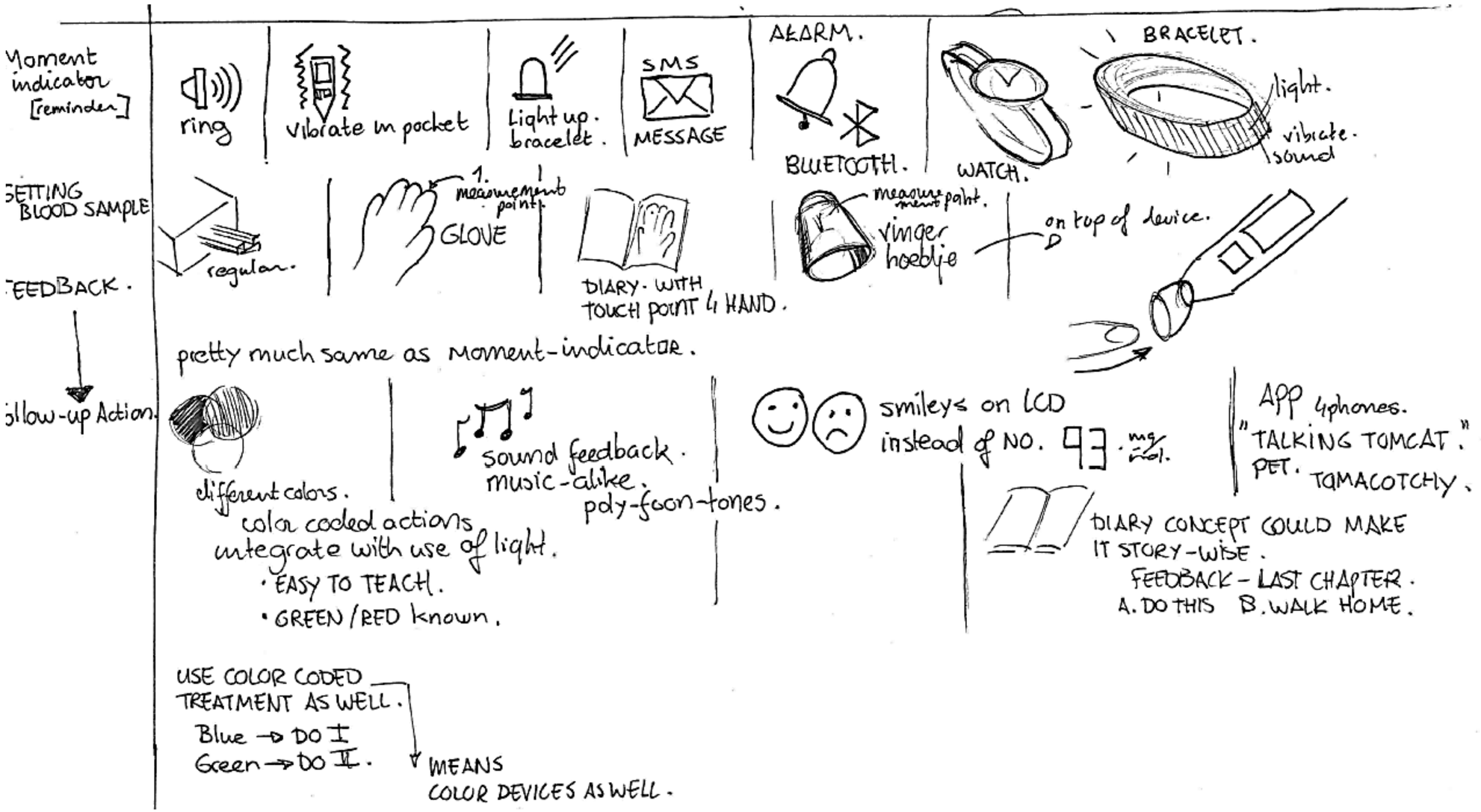


Systematic Approach

Heuristic Approach

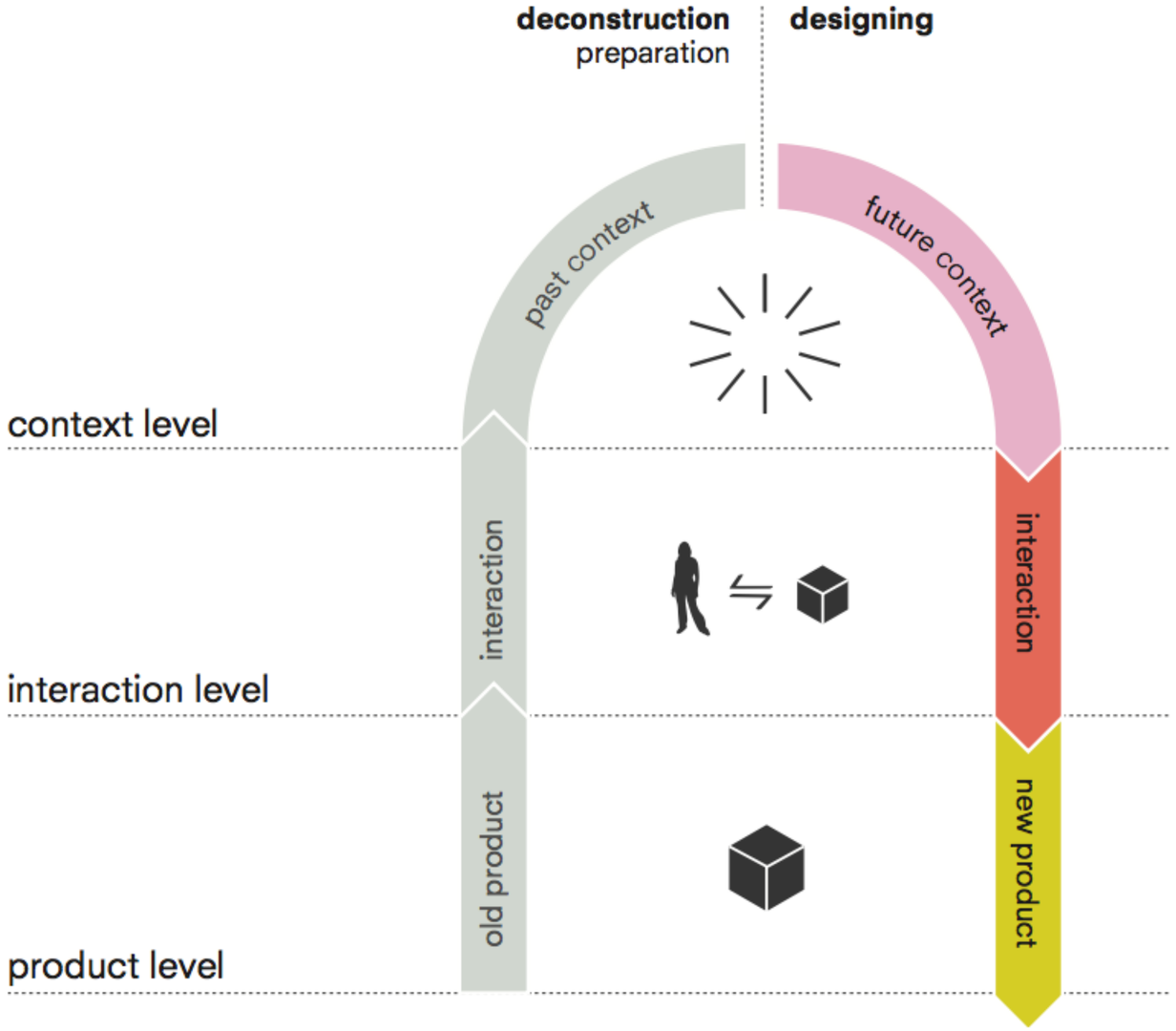


Morphological Chart



http://wikid.io.tudelft.nl/WikID/index.php/Morphological_chart

Vision in Design (ViP)



http://wikid.io.tudelft.nl/WikID/index.php/Vision_in_product_design

Design Principles: Android

Real objects are more fun than buttons and menus

Delight me Surprising ways

Get to know me

I should always know where I am

Keep it brief

Only show what I need when I need it

Make important things fast

Give me tricks that work everywhere

Sprinkle encouragement

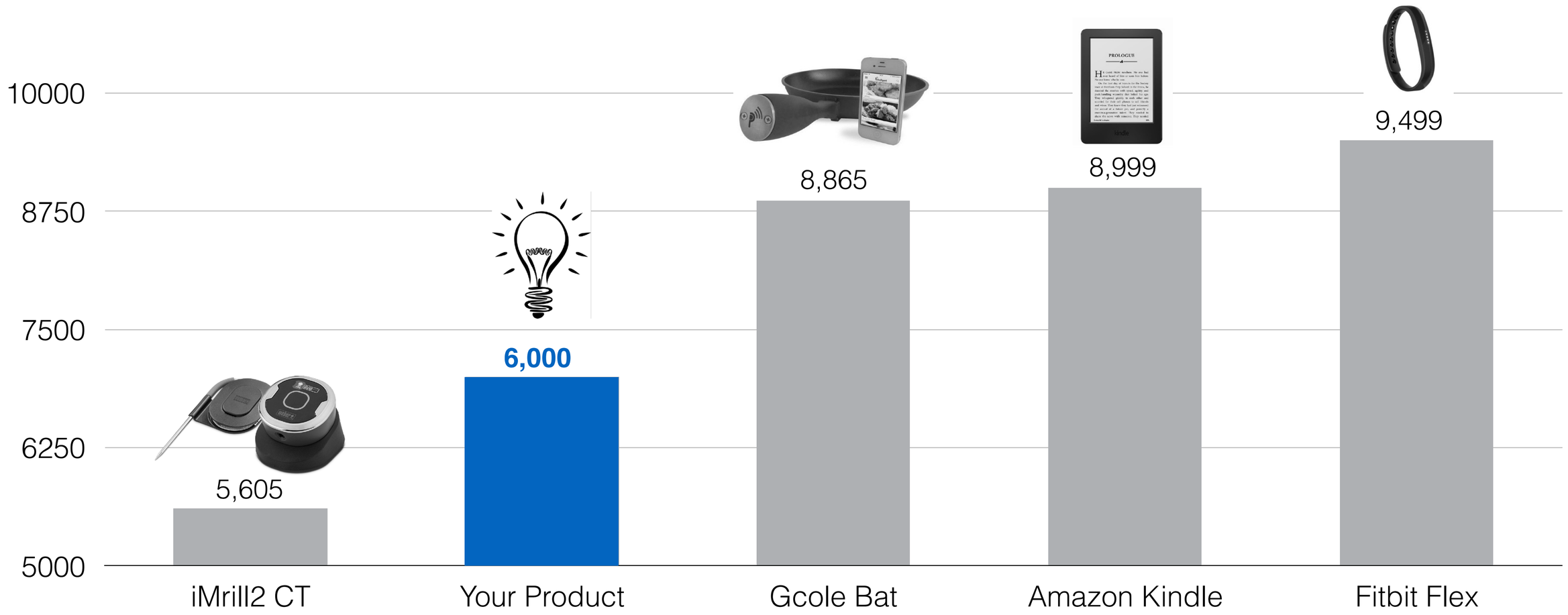
https://developer.android.com/design/get-started/principles.html

Product Requirements

- .....
- .....
- .....
- .....
- .....

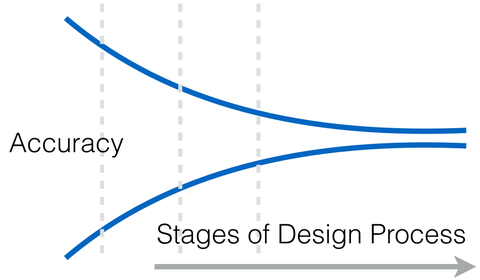
Product						
Description						
Key Features	1					
	2					
Specifications		Value	Basis/Evidence			
	Capabilities					
	Capacity					
	Expected frequency of use per week					
	Typical duration of use per use					
	Total run-time per week					
	Power Source					
	Product Life					
	Warranty					
	Target BOM Cost					
	Target Volumes (Y1, Y2)					
Design Considerations	Subsystem	Design Intent	Risks/Constraints	Target BOM	Components	Material
Customer misuse conditions / worst case scenarios	1					
	2					
Safety	1					
	2					
Regulatory Compliance/Certification	1					
	2					
Benchmark Products						

Price Benchmarking



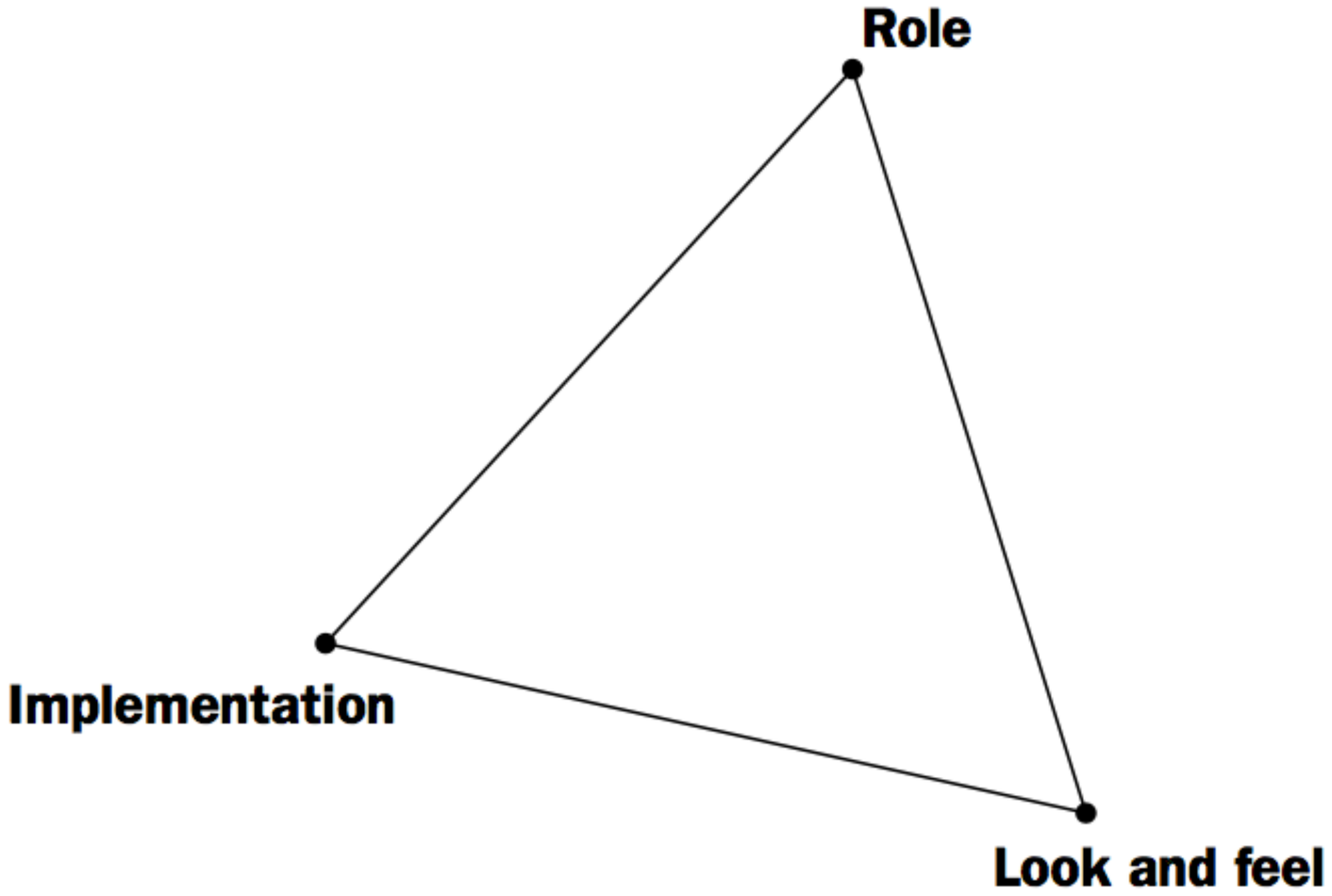
Bill of Materials

Bill of Materials														
Part name	Part number (File name)	Qty	Expected Properties	Material	Volume (cubic-mm)	Density (kg/cu-m)	Weight (g)/Unit [W]	Material Cost (₹/kg) [M]	Unit cost (₹) [C = W*M]	Process	Process Cost (P)	Unit cost (₹)	Cost (₹)	Remarks
Hex Rod	HHG-Hex-Rod-Aluminium	1	Tortional strength, Corrosion resistance	SS316	2166.75	8000	17.33	250	4.33	Standard 1/4 inch Hex rod and the tip is turned and parting done.	1.54	6.67	6.67	Assuming Rs.50 highe since GAD doesn't tra grade.
Bush	HHG-Bush-Nylon	1	Abrasion resistance, Low Friction, Bearing property	Nylon 6/10	221.44	1400	0.31	230	0.07	Injection Moulded	1.54	0.11	0.11	
Grinder Stone	HHG-Grinder-Stone-Alumir	1	Abrasion Resistance, Ability to maintain the cutting edges, Corrosion resistance	SS316	26316.6	8000	210.53	250	52.63	Machining / PDC / Investment Casting	1.54	80.97	80.97	
CAM Window	HHG-Clip-left HHG-Clip-Right	1	Transparent, Scratch Proof, Anti-fogging	PMMA	44.62	1190	0.05	180	0.01	Injection Moulded	1.54	0.01	0.01	
Top Lid	HHG-Top-lid-Acrylic	1	Tranparency, Chemically inert, Stiffness	PC	7423.23	1190	8.83	200	1.77	Injection Moulded	1.54	2.72	2.72	
CAM Knob	HHG-Grinding-surface-bacl	1	Abrasion Resistance, Soft edges,	ABS	612.97	1070	0.66	200	0.13	Machining / PDC / Investment Casting	1.54	0.20	0.20	



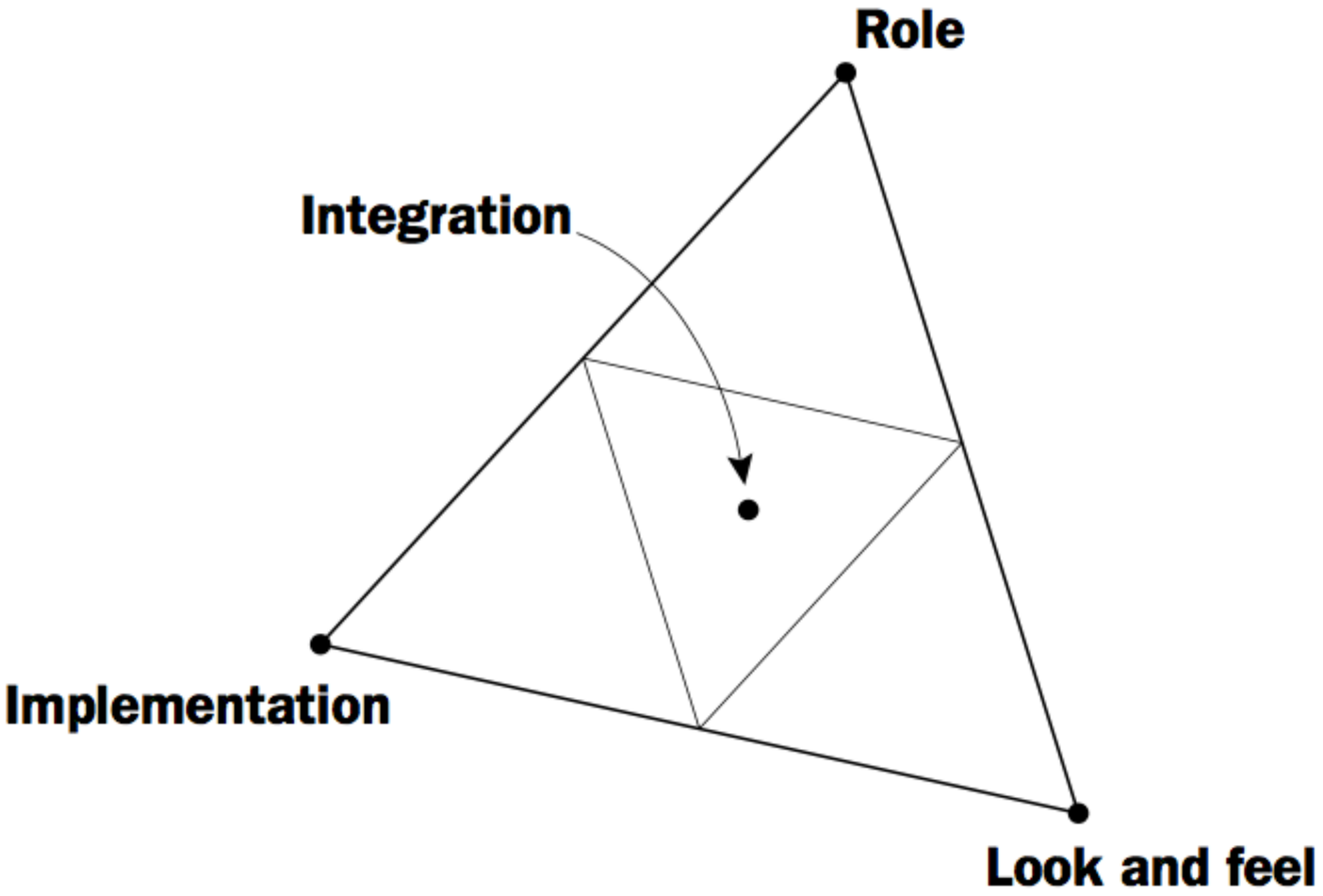
What do prototypes prototype?

A Model of What Prototypes Prototype



Houde, S., and Hill, C., What Do Prototypes Prototype?, in Handbook of Human-Computer Interaction (2nd Ed.), M. Helander, T.␣ Landauer, and P. Prabhu (eds.): Elsevier Science B. V: Amsterdam, 1997

Four Principal Categories of Prototypes on the Model



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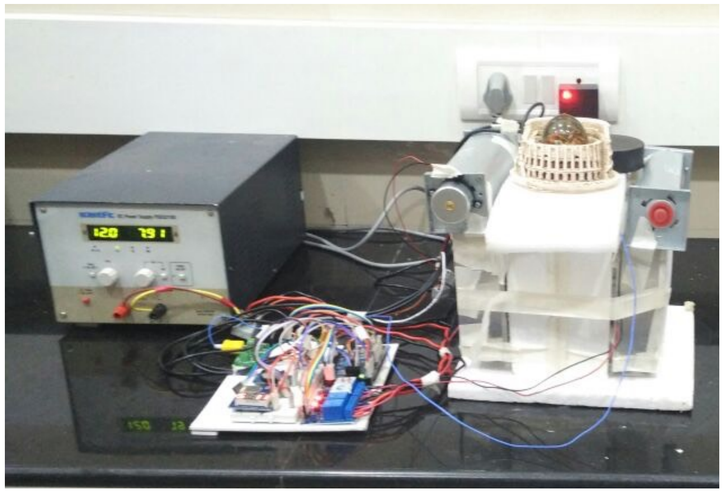
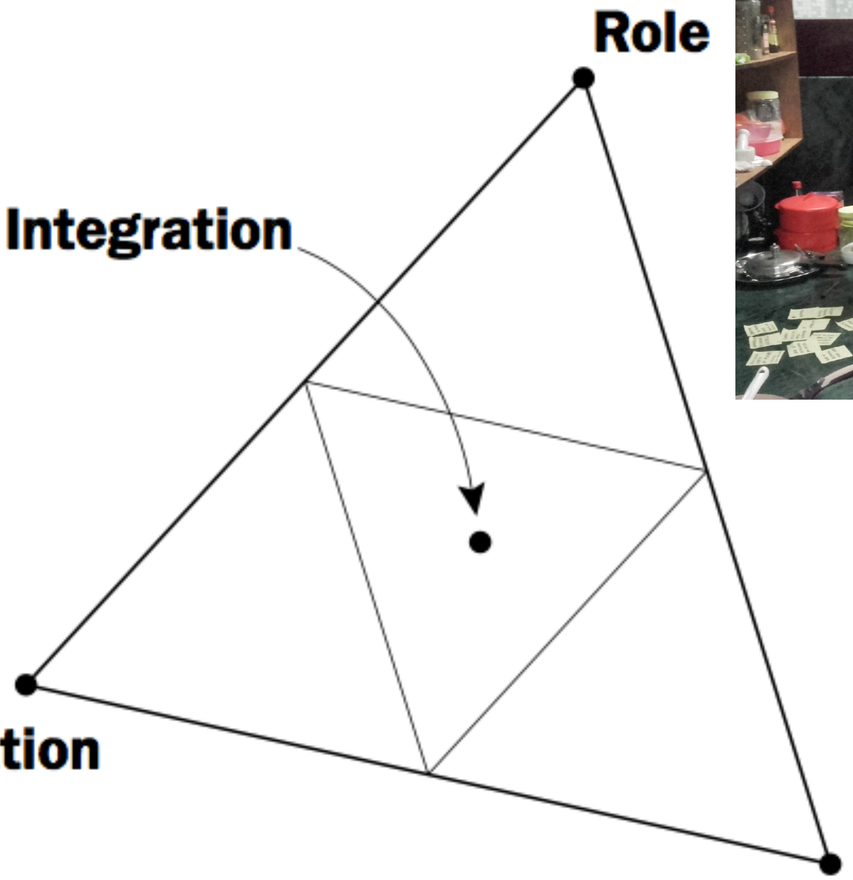
Four Principal Categories of Prototypes on the Model



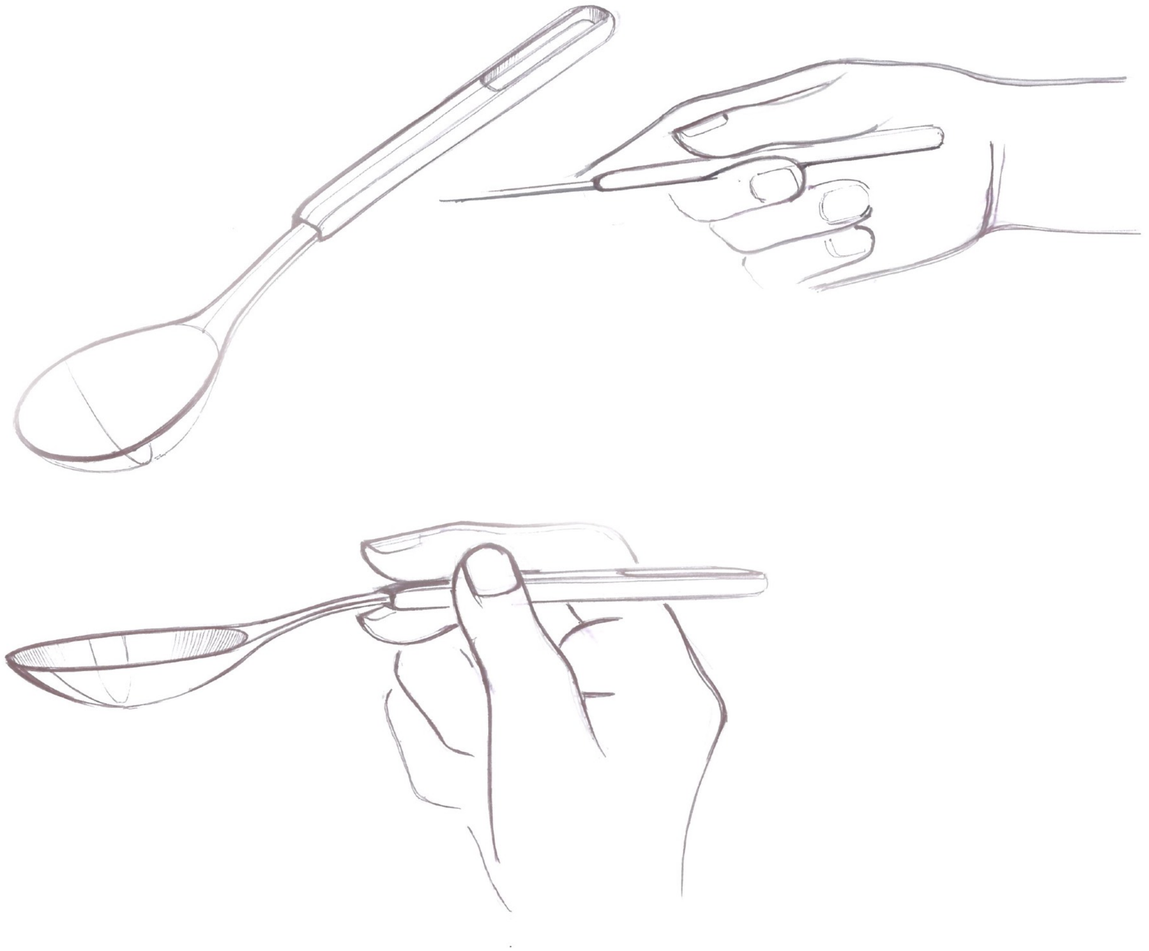


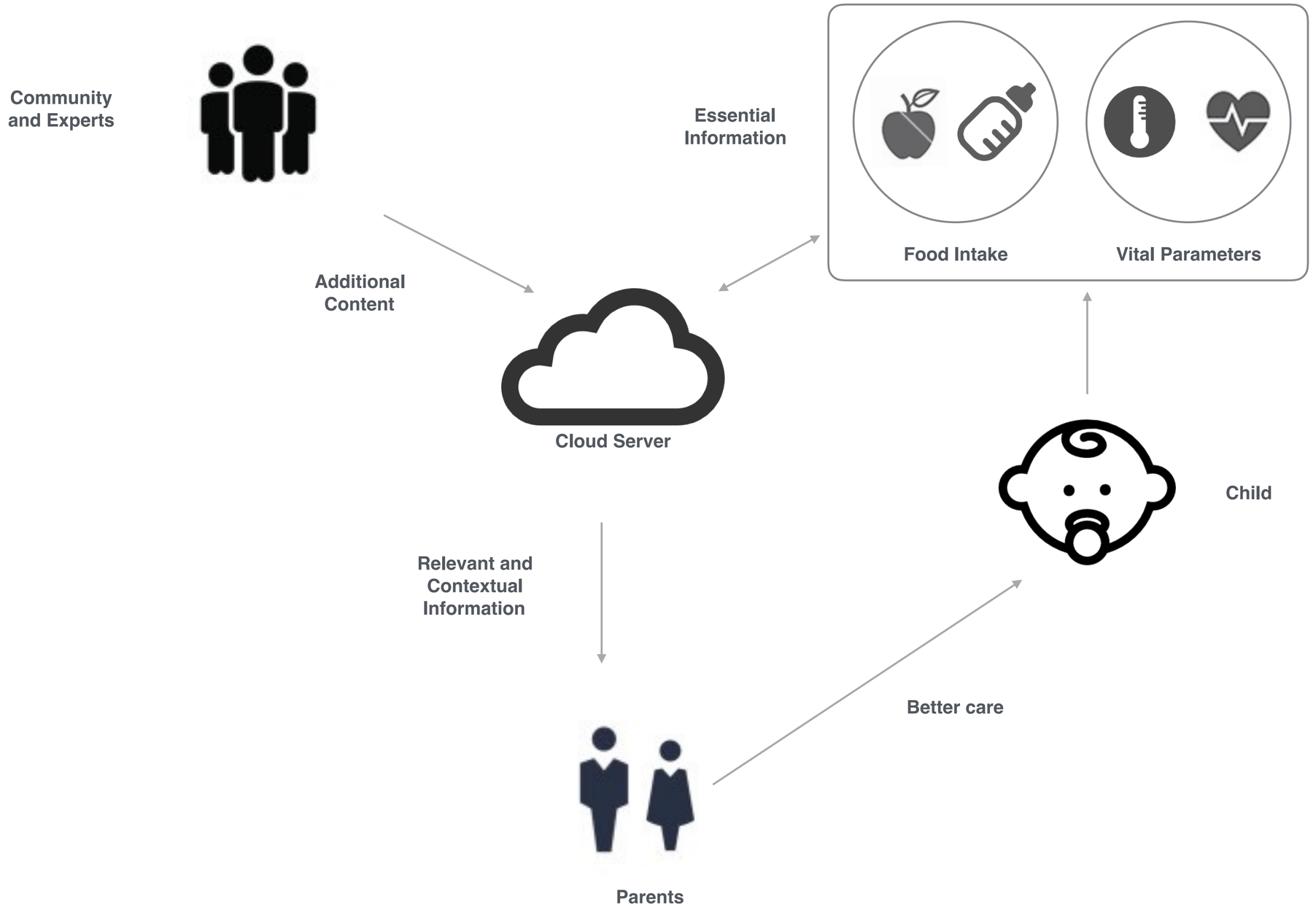
Physical + Digital

> The future is already here – it's just not evenly distributed.

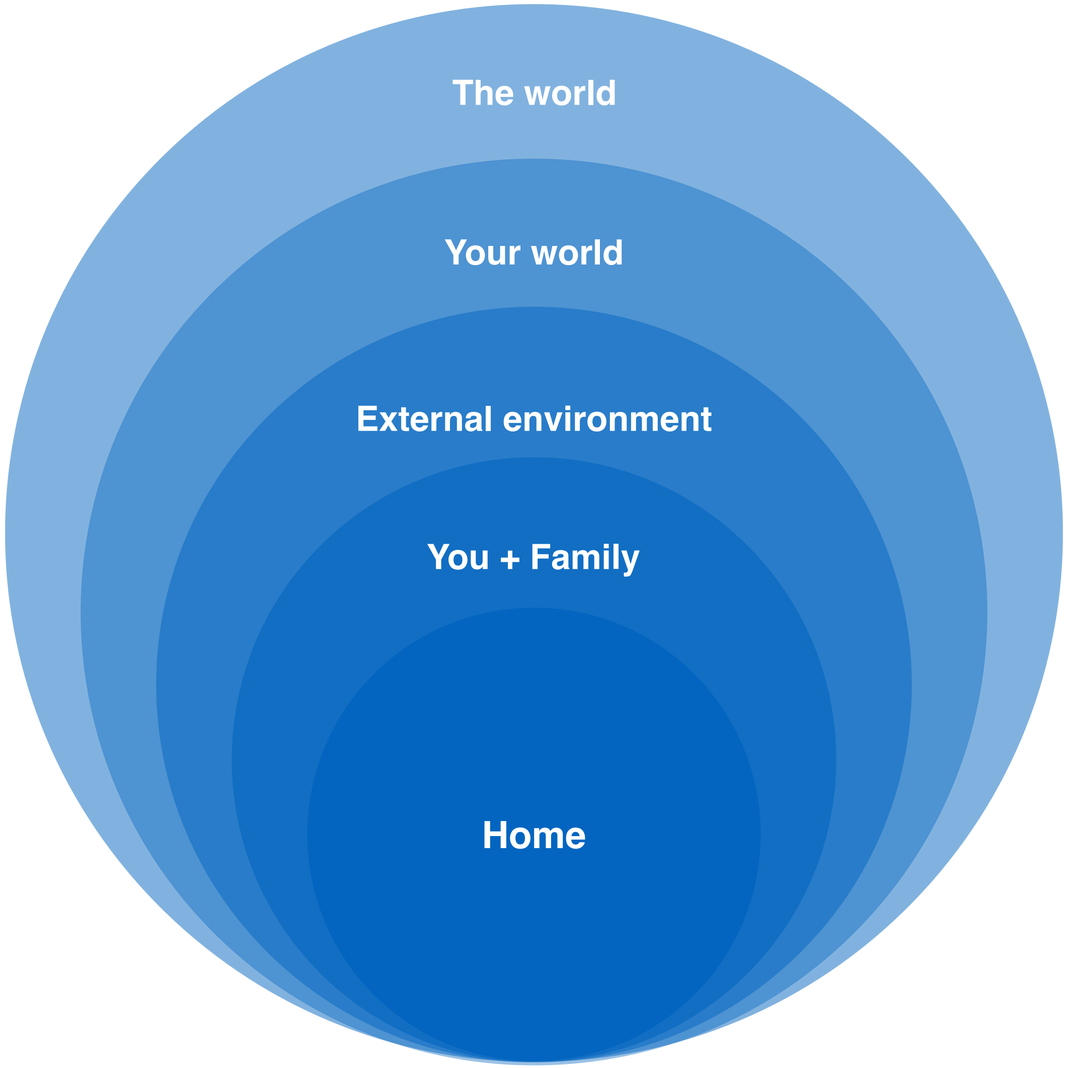
William Gibson
Father of the cyberpunk sub-genre of science fiction

Baby Food & Water Monitor




Community
and Experts
Essential
Information
Food Intake
Vital Parameters
Additional
Content
Cloud Server
Child
Relevant and
Contextual
Information
Better care
Parents

Connected Consumer Products



How is UX for IoT Different?

- Functionality can be distributed across multiple devices with different capabilities
- The focus of user experience may be in the service
- We do not expect internet-like glitches from the real world
- IoT is largely asynchronous
- Code can run in many more places
- Devices are distributed in the real world
- Remote control and automation are programming-like activities
- Complex services can have many users, multiple UIS, many devices, many rules and applications
- Many differing technical standards make interoperability hard
- IoT is all about data

Rowland, C., Goodman, E., Charlier, M., Light, A., & Lui, A. (2015). Designing connected products: UX for the consumer Internet of Things. O'Reilly Media, Inc., Chicago.

Connect to my product

Connect to my world
through my products

@nbhaskar888

nbhaskar888@gmail.com

nbhaskar888.wordpress.com