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In 1983, the workplace strategy and architecture practice, DEGW, published a highly influential study into the impact of information technology on the future of office buildings and the workplace, titled 'Office Research: Buildings and Information Technology' (ORBIT). Representing the first intensive research study into the organisational, technical and architectural demands of office work in Britain, the report concluded that the information age was rendering companies increasingly complex in their organisational and technological requirements, and ultimately more dependent on buildings. Although ostensibly a study about technological change, this paper argues that ORBIT should be viewed as a critical document in the formulation of the relationship between architects, suppliers, users and the state in the closing decades of the twentieth century. Sponsored by industry giants from real estate firms, construction and office supply companies, and government regulators, ORBIT brought together industries that were previously uneasy partners in post-war Britain but were being realigned under the Thatcher government's push for service sector innovation to revive the deindustrialised economy. Examined as both a product and instrument of neoliberal economic policy, the paper argues that the authors, sponsors and subjects of the research were linked by the demands of productivity, competition and performance both in and of the workplace. Within this analysis, DEGW's development of 'architectural consultancy', as a service that is distinct from architectural design, is interpreted as mode of repositioning the architect within the knowledge economy.

Introduction

In 1983, the workplace strategy firm DEGW completed a two-year research project that would irrevocably alter the future trajectory of office buildings in the UK and abroad. Titled 'ORBIT' (Office Research: Buildings and Information Technology; Fig. 1), the project aimed to assess 'the impact of information technology upon office work and office workers', and its consequences for the design of office buildings.[1] Concluding that the emergence of more advanced
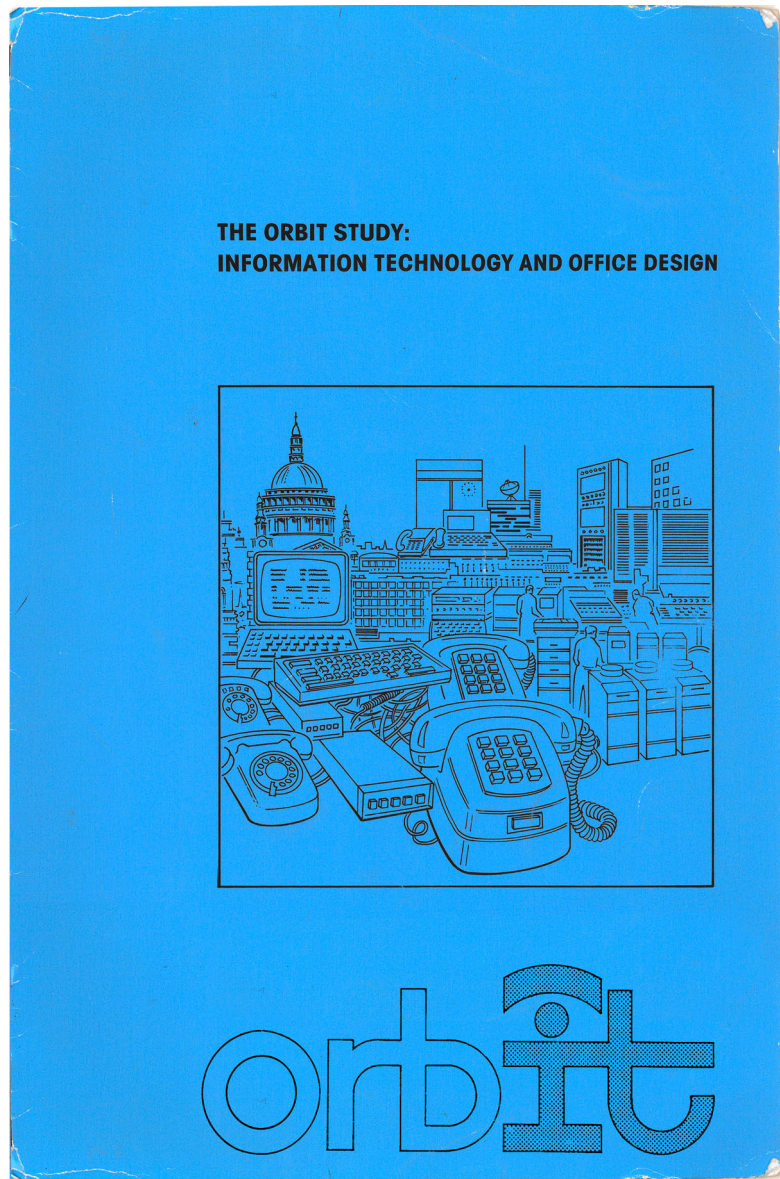
Figure 1.
Cover of the ORBIT report,
published by DEGW and EOSYS in
1983. Reproduced with the kind
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computing and telecommunications in an information-based economy would
heighten the dependency of users on their buildings, the study gave rise to inno-
vations in adaptable building construction and reconceptualised the relationship
between users and suppliers of office space.

The ORBIT study was unique at the time, not simply for its content and sys-
tematic, multi-disciplinary research methods, but also on account of its
funding mechanisms. Representing the first of DEGW's many 'multi-client'

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studies, ORBIT was sponsored by industry giants from the supply, rather than the demand side of the commercial property world (i.e. the producers of buildings, rather than the users/clients).[2] The list comprised: the regulatory bodies British Telecom and the Department of Industry; suppliers of office space, including Greycoat Estates in association with developer and investor Norwich Union, surveyors Jones Lang Wootton and Fletcher King, the development corporations of three Scottish New Towns, and firms in office construction, including the building services engineer Matthew Hall, the fee management contractor Bovis, and Steelcase, which was the largest office furniture manufacturer in the world at the time. The variety of research fields addressed in the report reflected the diversity of the patrons, ranging from ergonomics and organisational change, to surveys of technical equipment and economic analyses of the office market. The study was unparalleled in the breadth and depth of research into the design and use of office space.

DEGW's methodology brought together industries that were previously uneasy partners in Britain. The relationship between the architectural establishment, real estate firms and regulatory bodies was rife with prejudice and antagonism during the post-war heyday of welfare-state employed architects and planners.[3] ORBIT was produced during a historical moment in which these relationships were being radically reconfigured in the commercial sphere. The government's deregulation of architectural fees, the dismantling of the welfare state, and the privileging of public–private partnerships in the 1980s gave power to the real estate and construction companies, whilst policies of deindustrialisation, internationalisation and the growth of the service sector gave rise to a burgeoning office market. The interests of developers, financiers and users of office space were aligned through their embeddedness within a political economic structure in which competition and entrepreneurial tactics were dominant.[4]

It was within this structure that DEGW developed its unique architectural practice, which employed methods from management consultancy, sociology and market research to connect the supply and demand sides of commercial real estate. At a time when architects were being marginalised in the development process, ORBIT represented the introduction of a new consultancy model of practice that rendered the architect an indispensible mediator between these agents. Within this context research became more than a tool for design. It provided a way of connecting architects to a more diverse network of clients, enabling architects to become service providers in the growing knowledge economy. In can therefore be argued that ORBIT did not simply deliver a reworking of the office building. Rather, it reimagined the processes and professional relationships that underpinned the production of commercial architecture.

User-focused research

The ORBIT study sought to understand the scale and nature of imminent technological change in Britain, its impact on organisations, and the effect of this on building specification, construction, and the real estate market. The launch of

Figure 2.
Before the micro-computer
companies had to devote entire
floors to accommodate mainframe
computers. Photograph showing
the machine room of National
Provincial Bank at Draper's
Gardens, London, 1969.
Reproduced with the kind
permission of The Royal Bank of
Scotland Group plc ©

the personal computer by IBM in 1981 heralded a new era in IT, which brought about new possibilities and challenges with regards to office buildings. Where previously the bulk, heat and noise of mainframe computers had forced them to be located in separate rooms, floors, or in many cases, in separate buildings located outside city centres, the microcomputer could sit comfortably on any office desk (Fig. 2). The impact of this in organisational terms was potentially enormous, as it would improve communication speeds (thereby affecting locational requirements in real estate terms), increase investment per head, and transform space needs. In addition to the technological unknowns, the future of organisations was made all the more uncertain by the state of British politics at the start of the 1980s: the new Thatcher government's free market policies promoted de-industrialisation and the growing dominance of the service economy, the deregulation of financial markets, and the globalisation of production.[5] Furthermore, the shifting demographics of the workplace, such as the slow ascendancy of women to positions of power, and the rise of HR-based management policies called into question the existing cultural and spatial requirements of firms.[6] ORBIT aimed to address these uncertainties by looking at all aspects of office production likely to be affected, through a detailed survey of IT equipment, organisational case studies and building performance assessments, and investigations into the impact of IT on organisational management, on employment, and on workers directly (Fig. 3). While much of the report aggregated data from secondary sources on the IT industry, real estate economics and employment trends, the core of the research was user-focused, centred around 14 organisations occupying 17 buildings, all of which were 'advanced users of information technology.'[7]

In methodological terms, ORBIT aimed to bridge the knowledge gap that existed between supply-side expertise and user experience. The case study fieldwork for the report combined observational studies with direct interviews of

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Figure 3.
ORBIT was based combined first-hand observation of offices with specialist research into IT and organisational change. This page from ORBIT observes the installation problems with early micro-computers in offices. Reproduced with the kind permission of AECOM

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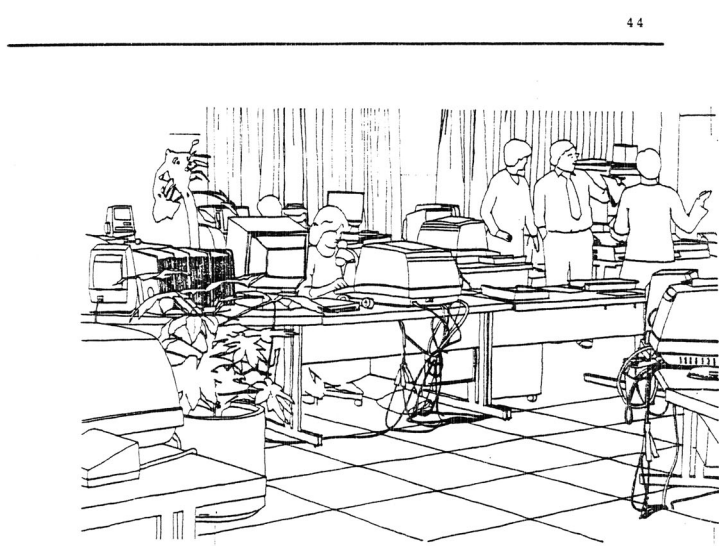
Figure 4.1: SURPLUS CABLE AT THE WORKPLACE

Hopes that a reduction in cables is just around the
corner are over optimistic. Neither local area networks
nor new signal media such as fibre optic and flat cable
will solve all cable management problems, even though
they may alleviate them in some situations. While fibre
optic can be used to link equipment in buildings,
attaching individual devices can prove expensive so its
economic feasibility is restricted to the larger and
more powerful installations. The use of flat wiring,

orbit

personnel (including those responsible for building management and data processing), as well as with experts in organisational development. The research team comprised designers from DEGW in collaboration with systems designers/automation specialists, Eosys Ltd., and Building Use Studies (BUS) (Table 1), a research-focused DEGW subsidiary set up with the firm ABK 'to assist architectural design through the systematic study of building use.'[8] BUS employed sociologists and social psychologists, such as Sheena Wilson and Peter Ellis, respectively, in order to understand the relationship between individual and organisational behaviour and the built environment. When the founders of DEGW, Frank Duffy and his former AA classmate John Worthington, set up

ORBIT Study Research Team	
DEGW (Architects and Space Planners)	Francis Duffy (Project Coordinator) Joanna Eley Patrick Manwell David Tooth
EOSYS Limited (Office Automation Consultants)	David Firnberg Diana Duggan Richard Oades Emma Bird
Building Use Studies (Design Researchers)	Peter Ellis Sheena Wilson
Consultants to the Research Team	
Bernard Williams Associates (Chartered Quantity Surveyors)	Bernard Williams
Ove Arup & Partners (Consulting Engineers)	John Berry
Arup Acoustics	Richard Cowell, Principal

Table 1.
Table showing the disciplinary breadth of researchers and consultants involved in the ORBIT project. Source: ORBIT, 1983.

the practice in London in 1973, the integration of organisational theory and office design in Britain was unprecedented. Although there had been some user-focused surveys published by state-funded bodies in the 1960s, such as the Building Research Station, the Ministry of Building and Works and the Pilkington Research Unit at the University of Liverpool, DEGW's emphasis on intensive client-focused research in the design of workplaces was entirely new.[9]

   The firm's emphasis on the user, and specifically on organisational dynamics, built upon Duffy's postgraduate research carried out in America in the 1960s, during the wave of the 'environment-behaviour studies' (EBS) movement.[10] Under the tutelage of Christopher Alexander at the College of Environmental Design, University of California Berkeley, and subsequently the sociologist Robert Gutman at Princeton University, Duffy developed a methodology that positioned the user, in relation to the organisation, as the generator of form. Rejecting architectural determinism, Duffy preached reciprocity as a core value of design, or what he would later call the 'principle of equivalence', arguing that 'whether physical environment or organisational structure is the starting point of an investigation matters less than the imperative to invent testable hypotheses to link both sides.'[11] At Berkeley, Duffy developed the model of 'job, worker, building' to test the relationship between the organisation of

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work processes, the way individuals behave at work, and the physical office space.[12] His basic claim was that in any given profession, 'certain kinds of behaviour may be predicted' which require specific types of physical environments. Drawing on Alexander's mathematical methods, Duffy viewed the problem of design as 'nothing less than a grouping together of the appropriate cluster or galaxy of patterns.'[13]

Duffy's interest in pattern analysis was not simply the way in which it prioritised use as the driver of form, but more specifically, the way it could be used as a tool for applied research. Alexander defined a pattern as the smallest identifiable relationship between physical things, which, in Duffy's words 'resolves a conflict between the desires or tendencies of the people who inhabit or use the built environment.'[14] In other words, patterns are the way that the actions and intentions of users are made possible in concrete, physical terms. These 'building blocks' can then be aggregated together in a multitude of ways to produce the design of an office building. This approach appealed to Duffy because of its empirical nature, but also because it aligned with 'the principle of taxonomy', whereby 'generalizations can be made and hypotheses tested at every scale'.[15] Alexander and Duffy's work was part of the trend towards systems thinking during the post-war period, whereby management science and mathematical theories like cybernetics were integrated into design thinking and artistic production.[16] In Britain, figures such as Leslie Martin at the Centre for Land Use and Built Form Studies, Cambridge University, Richard Llewelyn Davies and Peter Cowan at University College London, and Peter Manning at the University of Liverpool, integrated sociological research and systems theory into urban planning and design strategies for public buildings.[17] Inspired by D'Arcy Wentworth Thompson's text *On Growth and Form* (first published 1917), this generation of architects saw self-organising systems as a catalyst for form production.[18] The new availability of computers for research meant that user data could be aggregated *en masse*, and subsequently extrapolated to infer general ideas about building use in ways that had never been achieved before. In their first book, *Planning Office Space* (1976), Duffy, Worthington and Colin Cave paid tribute to 'the enormous amount of innovative work' recently carried out by these individuals and research institutes.[19] Pattern analysis and systems design gave hard data utility through processes of abstraction and taxonomisation, which for Duffy had 'great explanatory power' to challenge 'the stereotypes rife in the world of office design'.[20] Paradoxically, the appeal of user-based research was less about what it could relay about individual preferences, and more about its narrative potential for users as a general category in a given context.

Likewise, user research was carried out in ORBIT not for what it could say about specific firms, but rather for what it could infer about more general relationships between organisations and their buildings. The specific qualitative data collected from individual case studies was depersonalised and generalised for use in building assessments, which was arguably the most significant aspect of the report in terms of its application in industry. Here the results of interviews and observations were distilled into four general assessment criteria (Capacity, Adaptability, Buildability, and Manageability), which were used to provide a
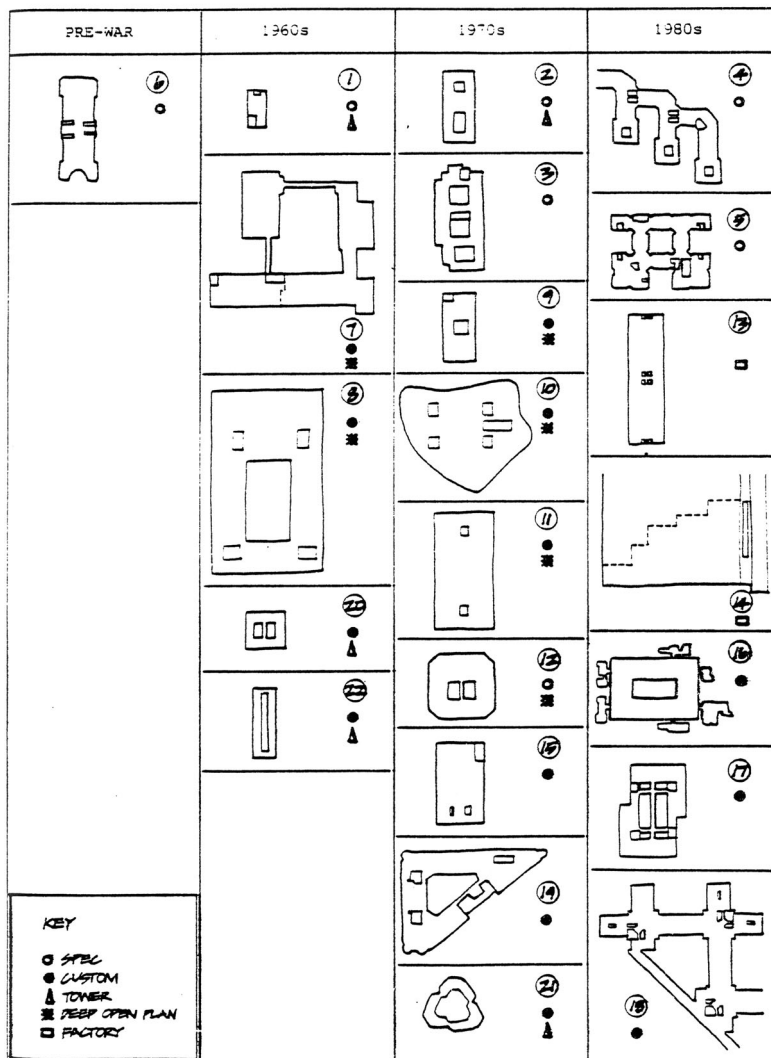
Figure 4.
Taxonomising at work in the ORBIT report. The illustration shows the floorplans of 22 buildings that were tested to determine their capacity to cope with information technology. Reproduced with the kind permission of AECOM

numerical rating system to test the 'performance' and in particular the 'suitability to accommodate information technology' of 22 diverse office buildings (Fig. 4).[21] To give one example of this process of abstraction, interview results had revealed that the desire for autonomous, personal workspaces with external views was considered to be highly important for employee wellbeing, a fact that had been largely overlooked by British trade union standards (in contrast to Scandinavian standards). In the building assessment appendix, this fell under the

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'capacity' criteria, and was translated as 'cellularisation […] i.e. the percentage of the usable area of a given office floor which can be converted into single office rooms of approximately 15 m^2, each of which enjoys an outside view.'[22] The section contained comparative floorplans, graphs and charts comparing such data in simple graphic form, to give visual logic to the numerical rating system. The report transformed situated narratives of users into 'generic relationships' between occupiers, technological infrastructure and their buildings in order to make the data comprehensible and applicable for the supply-side. Simply put, the ORBIT report packaged the data in a way that was beneficial for the sponsors; it translated qualitative material into quantitative data, which could be measured, and thus *valued*.[23]

The main conclusion of the report was that as IT became essential in the operation of firms, the building would become increasingly important to the user. It claimed that IT would lead organisations to invest more time and money in the design of the workplace due to the 'enormous increase in levels of capital investment backing each worker', leading to 'greater concern by organisations with aspects of the environment likely to contribute to staff morale and productivity', as well as the need to attract the necessary skilled staff, who were 'already in short supply.'[24] This shift, it argued, would have a profound effect on office markets, whereby locational value would be superseded by 'use value', forcing developers, suppliers and contractors to think more carefully about the quality of buildings on offer.[25] Most significantly for the sponsors, ORBIT claimed that most existing British office buildings would shortly become obsolete due to their lack of adaptability, which would be exacerbated by the acceleration of organisational and technological change in the new information economy. As such, the office building would not simply need to be of a better standard. Rather, it would need to be entirely reconceptualised at the structural level as *equipment* — an extension of the computer hardware — or, put another way, part of the telecommunications budget (Fig. 5).[26] The argument for this was that, with the need to constantly update and maintain technological infrastructure and with the increased volatility of organisations in the informational age, more money would be spent *after the point of construction* than at any other point in the building's lifecycle. This demanded a radical new approach to office design that privileged performance over time, rather than simply the provision of space. As the report stated in its final pages, 'the challenge is to devise methods of construction which […] allow easy access for change after the initial construction is complete. Building and adaptation are closer than ever before.'[27] The report concluded with a series of recommendations, at the core of which was a new approach to the office building as a series of time-limited layers, each with a different life span: the shell, services, scenery and sets (Figs. 6 and 7). The value of such a building was that each layer could be updated independently of the other, preventing the premature obsolescence of office buildings, which the report claimed was a result of the inextricable integration of the functional, structural and aesthetic components of existing office buildings.[28]

In sum, DEGW claimed that as buildings and technological infrastructure became more mutually dependent, occupiers would demand higher

Figure 6 • THE BUILDING AS AN EXTENSION OF THE COMPUTER
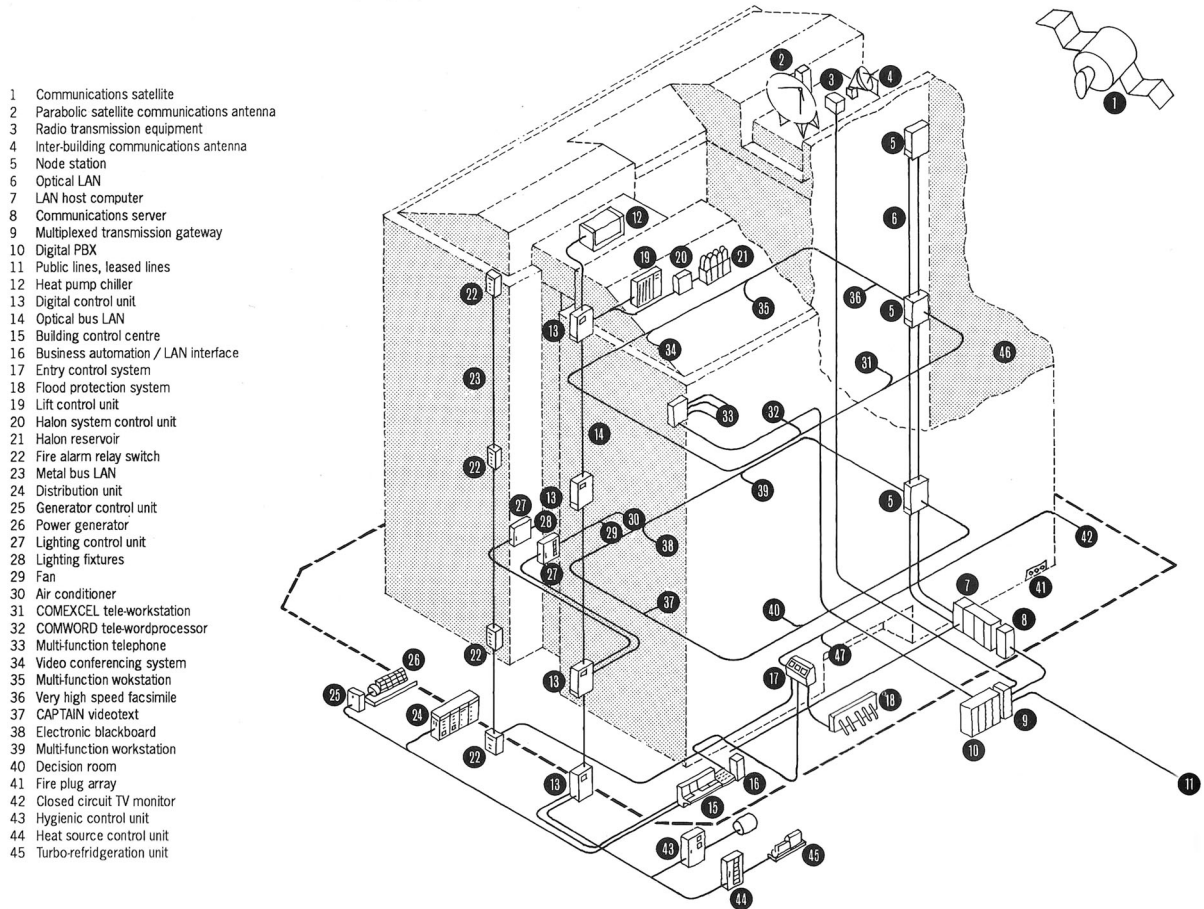
After an idea by NTT, Tokyo

1   Communications satellite
2   Parabolic satellite communications antenna
3   Radio transmission equipment
4   Inter-building communications antenna
5   Node station
6   Optical LAN
7   LAN host computer
8   Communications server
9   Multiplexed transmission gateway
10 Digital PBX
11 Public lines, leased lines
12 Heat pump chiller
13 Digital control unit
14 Optical bus LAN
15 Building control centre
16 Business automation / LAN interface
17 Entry control system
18 Flood protection system
19 Lift control unit
20 Halon system control unit
21 Halon reservoir
22 Fire alarm relay switch
23 Metal bus LAN
24 Distribution unit
25 Generator control unit
26 Power generator
27 Lighting control unit
28 Lighting fixtures
29 Fan
30 Air conditioner
31 COMEXCEL tele-workstation
32 COMWORD tele-wordprocessor
33 Multi-function telephone
34 Video conferencing system
35 Multi-function wokstation
36 Very high speed facsimile
37 CAPTAIN videotext
38 Electronic blackboard
39 Multi-function workstation
40 Decision room
41 Fire plug array
42 Closed circuit TV monitor
43 Hygienic control unit
44 Heat source control unit
45 Turbo-refridgeration unit

specification buildings and a greater level of shared expertise among suppliers.[29] The implication was that the built environment professions would need to coordinate and collaborate in ways that they had not before. Regulators would need to work with developers and surveyors to produce adequate policies for office production, in an economy that privileged information and services. Developers and surveyors would need to work more closely with architects, engineers and building contractors to ensure the economic potential of office buildings would be renewable over time. Architects, interior designers and furniture suppliers would need to liaise directly with building managers and IT specialists. And ultimately, all parties, at least in theory, would need to work with occupiers in a management climate in which employee preference was of critical concern regarding the design and let-ability of office buildings.

Figure 5.
Diagram envisioning the building as an extension of the computer hardware from DEGW, *The Changing City* (London: Bulstrode Press,1989). Reproduced with the kind permission of AECOM

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Figure 9.1: HOW ENVIRONMENTAL EFFECTS CAN BE DEALT WITH AT DIFFERENT LEVELS OF BUILDING DESIGN

	CABLING AND POWER OUTLETS	HEAT HUMIDITY	NOISE AND VIBRATION	DUST	ERGONOMICS	SPACE
SHELL	Ducting	Building Form	Building Form	N/A	N/A	Building Form
SERVICES						
Air Handling	N/A	Choice of system and zoning energy reclaim	N/A	Choice of system and zoning	Local control	Volume and ducts
Cabling	Volume and routability	N/A	N/A	N/A	Safety measures	Volume and ducts
Lighting	Provision for local lighting	Energy reclaim	N/A	N/A	Local control Appropriate level and types of illumination	N/A
SCENERY						
Furniture	New elements to cope with heavy cabling	N/A	Use acoustic potential of screens; mounting to cope with vibration	Hood and storage devices for computer materials	Appropriately designed chairs and workstations	Use of different surfaces and levels
Other Elements	New elements to cope with heavy cabling	Partitions flexibility	Partitions flexibility	Partitions flexibility Antistatic finish	N/A	New elements to adapt spaces to new uses
SPACE PROCUREMENT AND MANAGEMENT						
Procurement	Adequate volume and routability	Buildings which can be zoned and cellular	Buildings which can be zoned and cellular	Buildings which can be zoned and cellular	Controlled natural light and ventilation	Buildings which allow many planning and use possibilities; zoning
Management	Routability Accessible and flexible ducting systems	Use of zoning and adaptability to meet local demands	Use of zoning and adaptability to meet local demands	Finishes and maintenance	Local control to be reconciled with overall monitoring and control	Zoning for different uses and levels of servicing

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Figure 6.
Table from the ORBIT report showing design recommendations for dealing with the environmental effects of information technology in office buildings. Reproduced with the kind permission of AECOM.

The multi-client study in a neoliberal context

The necessity for collaboration was also connected to the new Conservative government's emphasis on private enterprise as a catalyst for economic development in Britain in the 1980s. The ORBIT study emerged at a period in British history in which the state was reconfiguring its relationship with the construction, design and real estate industries to facilitate its vision for deindustrialisation, outsourcing and the growth of the service sector. Building on the public-private partnership initiatives established in the 1970s, during its first term the Conservative government developed a number of planning instruments designed to directly engage developers, rather than planners, as the main drivers of new construction initiatives and to reduce the role played by local authorities.[30] The most powerful of these were Urban Development Corporations (UDCs). Based on US models, UDCs were set up to provide the financial incentives, administrative processes and infrastructure to encourage private investment. Overseen by independent executive boards, which were answerable only to central government, they behaved as the planning authorities for so-called 'redevelopment areas'. They were privileged with many of the associated powers of a public body, but not subject to the standard protocols of the public sector, such as: public consultations, open records, and compliance with civil service regulations.[31] The goal of such bodies was to create attractive con-
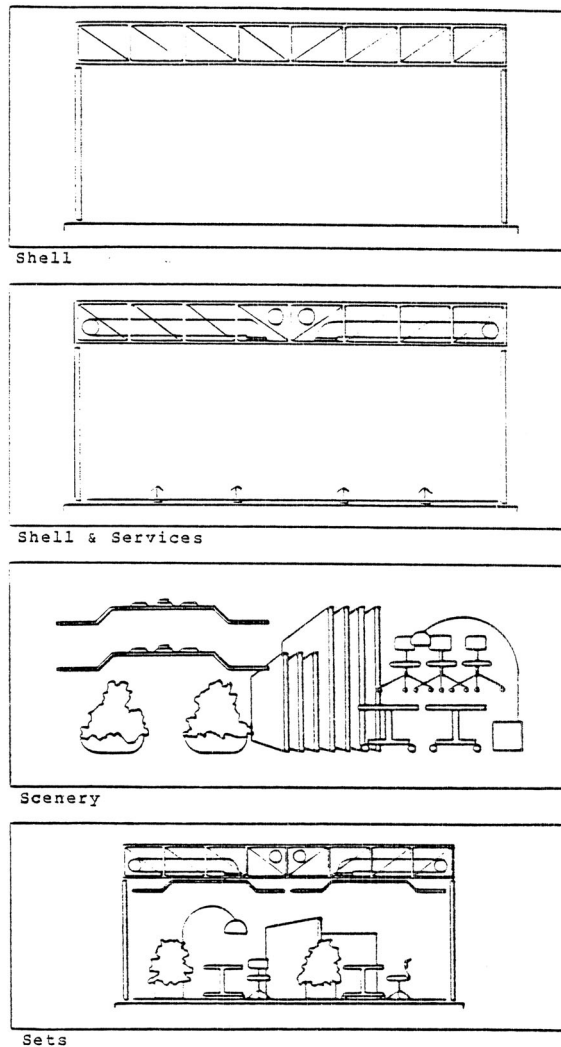
Figure 1.4: THE COMPONENTS OF THE OFFICE

ditions for the real estate industry to encourage development, and in turn create a 'spin-off effect', using property development to encourage more property development.[32] In other words, they were intended to stimulate enterprise rather than behave as tools for comprehensive planning.[33]

ORBIT was reflective of the new relationships being established between the state and the private sector to establish regions of innovation in Britain, whereby

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office development was used as a catalyst for transformation. As a sponsor of
the report, the participation of the development agency for three Scottish
New Towns, Glenrothes Development Corporation, was emblematic of this
shift. Although public-private partnerships with new town development corporations had been in place since the post-war period, such initiatives had previously been led by, and answerable to, local authorities.[34] Under Thatcher,
the marketisation of planning, implemented through legislation (such as the
1980 Local Government [Planning and Land] Act), circulars and policy, caused
local authorities to lose much of their power.[35] The New Town development
agencies were reconfigured to function more like Urban Development Corporations, with a goal towards incentivising commercial developments (particularly
in areas of declining industry), rather than the provision of social amenities and
direct investment in industry, as had previously been the case. Under the new
legislation, Glenrothes Development Corporation was charged with 'the establishment of the New Town as the administrative and service capital of Fife', and
to 'revive' the region as an information-intensive employment sector following
the dismantling of the industrial sector in Scotland.[36] Fife was one of many
regions in Britain which, from the late 1970s onwards, was re-configured in
this way. Prior to ORBIT, DEGW had already consulted for the Scottish Development Agency (Scotland's equivalent of the Department of Industry), which was
leading these developments across Scotland, and worked with similar development corporations in Wales and Warrington to establish 'the emerging needs of
the newer sort of business enterprise' alongside possible solutions in the form of
'simple, long-term', flexible office buildings and parks.[37]

The UDC model of development encapsulated the fundamental philosophical
tension between neo-liberalism and authoritarianism at the heart of Thatcherism: in order to ensure 'freedom' of the market, and ultimately the individual,
a powerful state was required to provide the framework for competition.[38]
Re-regulation, rather than deregulation, was the core principle. As Prior
notes, 'the primary goal of policy makers was to facilitate entrepreneurial activities within the private sector to achieve increased economic competitiveness,
thereby restoring the limited role of government as a regulatory mechanism
for capitalist accumulation.'[39] In redevelopment terms, nowhere was this contradiction more explicit than in the development of Urban Enterprise Zones
(UEZs): largely former industrial sites that were intended for commercial redevelopment, offering businesses who located there huge incentives, such as '100
per cent capital allowances for industrial or commercial buildings, exemption
from the Development Land Tax, a streamlining of the planning process, exemption from industrial training boards and minimal requests from the government
for statistical information for a 10-year period.'[40] The Department of Industry
(DoI), oversaw the development of fourteen UEZs between 1981 and 1982, distributed across the UK, with just one in the southeast — the well-known London
Docklands redevelopment.[41] Emerging from the radical anti-planning movement 'Non-Plan', conceived by Peter Hall, Cedric Price, Reyner Banham and
Paul Barker in *New Society* magazine in the 1960s, this once anarchic
concept became an emblematic campaign for the conservatives, touted in

1979 by Keith Joseph — the then Secretary of for Industry, and close friend and advisor to the Prime Minister — as 'demonstration areas' for Thatcherite, supply-side economics, 'where conditions more encouraging to enterprise might be established—to show what would then result.'[42]

The Conservative government's efforts to bolster the British service sector were further strengthened by attempts to improve the country's connectivity in the global financial economy. The UK was the first European country to deregulate its telecommunications industry, which had previously been mono-polised by the state-owned British Telecom (BT, part of the Post Office). In 1981, the British Telecommunications Act gave the Secretary of State for Indus-try the ability to license to other operators for the first time. This was part of the ideologically-motivated selling off of nationalised assets that took place within the Thatcher government in the name of free-market efficiency; the govern-ment and the finance industry believed that competition was necessary to handle the increasing complexity of digital services.[43] A new 'telematic' coalition emerged, comprising corporate users, information technology equipment sup-pliers and private service vendors, and by 1984, taking its cue from the recent US divestiture of the American Telephone and Telegraph Company, BT was com-pletely privatised.[44] Britain became the first country in the world to entirely break the public telecommunications monopoly by licensing Mercury Communi-cations, a competitor, to operate in the City of London (the financial centre) in a 'duopoly' with BT, and by 1990 over forty licenses were given to competitors to operate across Britain, representing the complete deregulation of the sector.[45] In addition to destabilising a powerful public-sector union, the government was responding to the financial services lobby at the core of the telematic coalition, which argued that more efficient telecommunications were necessary to bolster London as a 'premier centre of international finance'.[46] This world-city rhetoric was reflected in the ORBIT case study sample, with twelve of the case study firms located in London, nine of which were in the financial services and support sector.[47] As David Harvey has noted, the emphasis on improving 'efficiency and centrality within a worldwide communications net' and on providing well-equipped office space to speed up transaction times was a vital part of the 'urban entrepreneurialism' led by the Conservative government, which was 'strongly coloured by a fierce struggle over the acquisition of key control and command functions in high finance, government, or information gathering and processing'.[48]

The public–private coalitions in real estate development and communications brought new opportunities for developers and the building industry at large, yet simultaneously introduced high levels of uncertainty regarding how new developments would be integrated into existing business infrastructure networks. As the ORBIT study noted in its conclusions, the impact of IT was not limited to the structural and functional capacities of buildings, but would radically alter the foundations upon which the entire British property market stood.[49] The privatisa-tion of telecoms brought about a more competitive environment, ensuring that the speed of IT innovation — and ultimately communication — became much faster, which raised inherent incompatibilities between building lifecycles and

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technology development cycles. Added to this were predictions that IT advancement would decrease office employment, thereby reducing the demand for office space in the coming decade.[50] However, the effects were quite different. The internationalisation and liberalisation of financial markets, which began with the removal of exchange controls in 1979 and culminated with the Big Bang of 1986, increased office employment in London. Additionally, the need to accommodate more technology also increased the average floorspace per employee.[51] With more advanced telecommunications, the real estate market became much stronger as locational considerations became less important to business operations. Large metropolitan areas remained attractive for headquarters but 'place loyalty' was gradually diminished as communications decreased the necessity for physical proximity with support services.[52] Similarly, companies became more amenable to setting up back office activities and R&D facilities in satellite parks outside the city.[53] The latter was partly due to a change in the Use Classes Order in 1987 to include a new, flexible planning category, B1, which blurred the distinction between industrial and office buildings. This catered to the burgeoning pharmaceuticals and IT industries, as it enabled office, research and light industry to be carried out in a single property, giving rise to high profile business parks such as Aztec West outside Bristol, and Stockley Park near Heathrow.[54] As a result, the widespread availability of more sophisticated IT services reduced the uncertainty in property investment decisions for companies, thereby strengthening the real estate market, and more importantly, shifting the locus of attention (and profit) in commercial property from the space:location ratio, to 'use value'.[55]

These transformations rendered developers, surveyors and large-scale building contractors more powerful in the building industry. Improved telecommunications reduced the locational uncertainties in users' property investment decisions while opening up new markets. In addition, government policies that weakened local authorities simultaneously strengthened developers by shifting the planning process in the developer's favour — such as the imposition of time restrictions for processing planning applications and financial penalties on local councils for making 'unreasonable' refusals — thereby facilitating the rush of successful applications for commercial development in the 1980s.[56] These opportunities, in tandem with the ready availability of credit, gave rise to a new breed of financially innovative and ambitious developer. The strength of these firms was that they were able to become very profitable, very quickly, by restricting their activities to 'property trading and development for sale' and by embracing new financing mechanisms which enabled them to build up huge debts whilst keeping them off the balance sheet. This made it easier to finance much bigger and more complex projects at relatively low risk.[57] In tandem, developers, surveyors and large-scale building contractors were able to grow by becoming 'hollow corporations', relying on 'just-in-time' construction techniques, subcontracting, and temporary, 'self-employed' staff, thanks to the weakened position of the unions.[58]

As a result of their increased status, developers became more involved in the architectural process, shifting towards a model of developer-as-patron. Stuart

Lipton of Greycoat (who later founded Stanhope), was an example of the new 'enlightened' developer, who became known for his close working relationships with high profile architects, as well as his role in British public and cultural life.[59] A member of the Royal Fine Art Commission, Lipton later became the Chairman of the Commission for Architecture and the Built Environment (CABE), and was made an Honorary Fellow of the RIBA — the latter a rare honour for a developer, whose profession was condemned 20 years earlier by then RIBA president Lionel Brett for being made up of nothing more than opportunist intermediaries, interfering between 'makers and users'.[60] Yet, ironically, it was precisely through such intervention that developers like Lipton became so successful. As DEGW noted in their introduction to ORBIT, increased reliance on IT and organisational change would have 'the effect of making sophisticated organizations increasingly dependent on buildings.'[61] The growing dependency between user and building reciprocally heightened the dependency between market and user, forcing developers and architects to produce appealing, functional, and adaptable buildings in order to obtain the competitive advantage.[62] As Duffy noted, 'poorly designed, ill-conceived, unusable offices will stick: well-thought-out, skilfully designed and highly usable ones will be let.'[63] Developers shifted away from a purely spatial concept of value (minimising gross to net ratios), to a qualitative definition of value, whereby impressive architect-led developments were more likely to attract publicity and tenants.[64] As such, it became an essential part of the successful developer's business model to partner with well-known architects to obtain prestige project status. Lipton, for example, became known for his early collaboration with Richard Rogers on the ambitious Coin Street Development (1978–84), on the South Bank of the Thames, which, although never realised due to local backlash and activism, solidified his reputation among architects and government agencies.[65] Such partnerships extended beyond the architect, as Lipton surrounded himself with specialists to advise on projects. As Goobey notes, for the development of 1 Finsbury Avenue, designed by the well-regarded Arup Associates, the developer curated 'a team of ad hoc advisors on whom he relies and with whom informal discussions on all aspects of design, building and legal matters are often held. Among this group are Frank Duffy, the architect head of DEGW, Gary Hart of lawyers Herbert Smith, and executives from the Economist Intelligence Unit and Schal'.[66] Finsbury Avenue, like Broadgate and Stockley Park to follow, was considered to be a risky investment due to its position outside the traditional heart of the financial centre, in addition to the aforementioned uncertainties surrounding users and the office market. Lipton understood that good research was essential to producing a development that was financially viable and 'future proof'.[67]

DEGW: architect as consultant

In order to remain profitable within the changing political-economic landscape of Britain in the 1980s, the built environment professions had to acquire more extensive and specialist knowledge of the markets and consumers operating

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within the burgeoning service sector. For DEGW, the emphasis on research that served both suppliers and users was a way to carve out a significant niche for itself within the growing knowledge economy at a moment when the British architectural industry was highly unstable. Before this period, commercial architects, real estate firms and the building industry had developed a negative reputation for building unremarkable architecture, overspending, and taking far too long in the process.[68] The introduction of 'design and build' bundles became a popular remedy, offering the client a tightly managed service focused on temporal and economic efficiency, yet simultaneously marginalised the architect in the process.[69] As Worthington noted in 1992, 'construction managers, QS dominated project managers, and developers are increasingly acting as the direct interface with the design professional as subcontractor.'[70]

DEGW established a place for itself in this changing industry by adopting the strategies of specialisation and flexibility that characterised the neoliberal policies underpinning it. Specifically, the firm repositioned itself from architectural practice, to architectural consultant. In the mid 1990s, around one third of the firm's activities were devoted to consultancy, and in 1996 it launched an international consulting arm with new offices planned in New York and Kuala Lumpur. 'The expansion is directly related to our ability to carry out architectural consulting anywhere in the world', Duffy remarked in an interview with the *Architects' Journal* in the same year. 'We pride ourselves as deliverers of workplace solutions, as communicators, doers as well as thinkers, practitioners as well as theorists.'[71] Whereas management theory had always underpinned Duffy's ideas, the establishment of a separate consulting arm reflected increased demand for management expertise in the design and conception of office buildings. Following on from ORBIT, and its North American successor ORBIT 2, DEGW published a third significant multi-client study in 1992, titled *The Intelligent Building in Europe*, which claimed that too much emphasis had been given to technology in the conception of building intelligence, and instead organisational goals should be the focus.[72] This would be achieved through 'marrying business management with building management with space management.'[73] As Worthington noted, the report thus 'identified a growing need for companies that can integrate design implementation, information technology and management services at all stages of the design construction and operating process.'[74]

In effect, DEGW became a consultant at every stage of this process. In 1995, the firm appointed a management consultant, Tony Thomson, as its managing director. Thomson argued that the strength of the firm was in its low-key, client-centred approach:

> Our unique selling point is that 90 per cent of firms will give you an architect to do any kind of consultancy. If you come to DEGW you get a consultant to do consultancy. [...] I think clients have got as much right to design as the designers they employ. [...] The challenge for the architect is that they have to help the client achieve that design.[75]

In addition to business management and space management (design), the practice also consulted on building management, more widely known as facili-

ties management (FM). ORBIT had claimed that as buildings were increasingly complex, proper FM was essential to ensure proper use of resources.[76] In 1982, Worthington and Duffy established the journal *Facilities* to promote this as yet unknown profession in Britain, arguing that 'facilities management was to architecture as software was to hardware in the world of the computer — an essential means of ensuring that clients' intentions, expressed in building briefs, should be reviewed, monitored and updated throughout the entire life-time of each building.'[77]

The consultancy model positioned design just one dimension of the architec-tural practice's offering, all of which was in service of the user. As service-sector markets became larger and more volatile, and organisations became more complex, DEGW claimed that buyers would demand more adaptable buildings that could be tailored to their specific operational and economic needs.[78] In this consumer-facing market, knowledge would be the architect's and the develo-per's most valuable tool. Organisations wanted to know how to optimise their productivity, in terms of the economic performance of their building over time, as well as the everyday performance of their workers. DEGW answered these questions through systematic research into the everyday oper-ations, culture and spatial needs of each client, which would then result in rec-ommendations and a brief for a building. ORBIT represented the first attempt to codify and generalise these findings in a way that would be profitable for sup-pliers. The study formalised a number of the firm's research techniques, which became central to the practice and later, to the architectural profession at large. These included: workshops with client steering committees to identify corporate culture, structure, and business direction and vision; observational methods, such as time utilisation studies and space audits; staff focus groups; execu-tive/designer liaison; interviews with senior management to identify perception of work process and content; wider sectorial research; post-occupancy building appraisals; and extensive recommendations and documentation.[79]

Through these methods, DEGW redefined architectural practice as a collec-tion of services offered to the client, of which the collection and distribution of information was equally important as design. In fact, while these two pro-cesses informed each other, Duffy saw them as distinct, warning that 'although consultancy often brings with it the chance to do design work, it must never be taken with specifically that intention', which he claimed would be 'corrupt'.[80] Knowledge production through client research was a discrete business activity, which could generate a separate revenue stream and bring DEGW into a second market. This dimension of the business was advertised through the publication of investigations like ORBIT, which was released to the general public in summary form and distributed via the British Council for Offices, but also offered as a consulting package, whereby clients could received the full report with two days of consultancy for £5000.[81] Following the success of ORBIT, DEGW published a number of highly influential multi-client reports in Europe, South-East Asia and North America. These permeated industry culture through media coverage (journals) and through influential projects, like Lloyd's of London, 1 Finsbury Avenue, Broadgate and Stockley Park — all

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FINSBURY AVENUE AND THE ORBIT REPORT

3.00 FINSBURY AVENUE 7

3.01 THE BUILDING
The office development at Finsbury Avenue is remarkable. There is no doubt in our minds that the building will be beautiful, by far the finest looking speculative office building built in London since the War.

There are buildings under construction such as the new Lloyds, or in design, such as the proposed Hays Wharf project, which are comparable. However, in terms of appearance and architectural quality Finsbury Avenue is a very rare example of the application of first class architectural skills to the problem of the London speculative office building.

But does the building work? Let us apply the ORBIT criteria.

3.02 DEPTH OF SPACE
Despite a complex section (Figure 1), the vast bulk of space in the building will be 13.5m (45ft). The module is such that it is quite likely that there will be three zones of space, including a narrow middle zone for some of the ancillary accommodation that is required. The sketch (Figure 2) shows how this can be achieved.

Since the position of the main circulation routes is not totally determined either by structure or by access, there is a high degree of freedom for layout. However, it is worth noting that the plan form of the building is very efficient in the proportion of usable office space in relation to the primary circulation and core (see Appendix 1).

3.03 CELLULARISATION
One of the most important criteria of the ORBIT report is the capacity to divide a floor up either into small single offices or
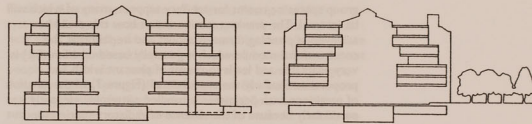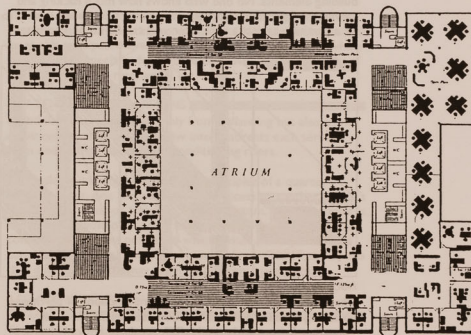
FIGURE 1

ATRIUM

FIGURE 2

SPACE PLANNERS AND ARCHITECTS 8-9 BULSTRODE PLACE, MARYLEBONE LANE, LONDON W1M 5FW TELEPHONE 01-486 9281, TELEX 291682 DEGW

Figure 8.
Page from a report by DEGW for the developers of 1 Finsbury Avenue, Rosehaugh Greycoat Estates Ltd., on the extent to which the building complied with the findings of the ORBIT report. Reproduced with the kind permission of AECOM and the University of Reading, Special Collections

of which were directly shaped by the methods and outcomes of ORBIT (Fig. 8).[82] The firm occasionally also published research carried out for individual clients, such as *Eleven Contemporary Office Buildings* (1986) and *Broadgate in the World Context* (1991). Both implemented what Duffy himself referred to as 'avowedly consumerist techniques — for instance, by using graphics imitating the way in which factual comparative information about refrigerators and cars is habitually presented in consumer magazines — in the assessment of architecture.'[83] In addition to publications, DEGW curated other opportunities to publicise and disseminate their research, such as the Workplace Forum, established in 1991, which involved an annual gathering of a network of clients to discuss important topics in the field of office design, with the aim 'to advance best practice in the design and change management of the business workplace.'[84] Worthington notes that, while the exercise often involved circulating their ideas to their direct competitors, 'you get more out of being generous as it makes the market bigger, so long as there is clear authorship.'[85] According to the former head of DEGW International Consulting Ltd., Despina Katsikakis, '[the workplace forum] was the most successful PR exercise

we ever did.'[86] DEGW used research as a way to connect the firm to a trans-forming office market, whereby both users and suppliers were becoming increasingly embedded within the processes and techniques of the knowledge economy.

Conclusion

ORBIT is significant in the historical development of the office building, not so much for its direct influence on design, but rather for its influence on the way in which the suppliers of office space collectively produced buildings. Employing sociological techniques and market research, the report underscored the way in the information age was rendering users increasingly complex in their organisational and technological requirements. In particular, the rate of change of these requirements was increasing as a market-based economy made organisations, as well as office markets, inherently unstable. Consequently, suppliers had to better understand the client in order to be profitable, and to produce buildings whereby the economic, built and technological structures that underpinned them operated in mutually beneficial ways. This required better communication between parties, and mediation through specialists such as workplace strategists (like DEGW), facilities managers and IT consultants.

Viewed in this way, ORBIT might be seen as both a product and instrument of neoliberal economic policy. The report was produced at a historical moment in which the notions of performance and competition were at the core of government strategy. Under Thatcher, the state harnessed service sector innovation to revive the deindustrialised economy, devolving power to private sector developers and contractors, rather than local governments and planners, to lead the way in building this revolution. Simultaneously, government deregulation in financial services, the dismantling of labour unions, and the emphasis on global trade rendered organisations increasingly concerned with worker productivity to generate shareholder value. The regulatory bodies, real estate and construction industry, and equipment suppliers that sponsored ORBIT valued a user-focused report not simply to understand the market better, but more precisely because they were enmeshed within the same political-economic system that demanded mutual productivity. Both the sponsors and the subjects of the study were linked by a common interest in the performance of these buildings as the equipment of production.

DEGW repositioned the architect between the demand and the supply side to take advantage of this common interest. The firm recognised the link between the two as management: the combination of business management, building services management, and space management was critical to the economic performance of the building for the user and for the supplier. Just as the goal of management theory is ultimately to gain the highest output from an organisation, building management and space management are also concerned with maximising resources. Whereas Duffy's development of the time-layered building might be viewed as the key design discovery to have emerged from ORBIT, it

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can be argued that the model was simply a reification of a management-oriented design process, which was in fact DEGW's most striking innovation.

Duffy's goal in working across the built environment professions was both moralistic and pragmatic. In an article by Duffy and Andrew Rabenack published in 2013, the authors quote Sir John Soane to remind the reader that professionalism was once based on the idea that architect is 'to be the intermediate agent between the employer, whose honour and interest he is to study, and the mechanic whose rights he is to defend,' or, in their words: that professional status could only be justified by the architect playing an 'ethical role' as a broker to 'ensure fairness between the conflicting pressures of demand and supply.'[87] For DEGW the process of mediation was enacted through research and the sharing of information across the industry, or what Duffy perceived as 'facilitating the exercise of fair judgement and trust by both sides and helping clients achieve desired outcomes in the context of a recognised body of knowledge about what buildings can and cannot be expected to deliver within a range of changing circumstances.'[88] Of course such idealism is difficult to uphold in the commercial context. Knowledge, as in all other professions, was a commodity that was ultimately subject to the processes of standardisation and generalisation that the knowledge economy demands. The level of research and close relationships with supply-side clients was difficult to maintain and not financially viable. In 2009 DEGW was bought by construction consultants, Davis Langdon, and subsequently absorbed into AECOM, the American multinational engineering firm, as Strategy Plus, which has lost much of original firm's rigour and ambition. The field of workplace strategy, or workplace consulting, that DEGW established has now become a prominent and ambiguous service which is offered by large corporate architecture offices, as well as by real estate firms, engineers, construction consultants and management consultants. The collaborative nature of the method DEGW used in studies like ORBIT was dissolved by its own multidisciplinary logic in an economic framework that demanded specialisation and competition.

Notes and references

1. DEGW and EOSYS Ltd., *The ORBIT Study: Information Technology and Office Design* (London: DEGW and EOSYS, 1983), p. 2.

2. DEGW had connected with developers and large-scale contractors whilst working with a number of development corporations towards the end of the 1970s but had not been commissioned to work for them. Similarly, while members of the practice had previously undertaken some consultancy work for the government, this too had fallen into the demand side category or taken the form of masterplanning for local authority projects. See, for example, Francis Duffy, 'Status and the Design of Civil Service Offices. Unpublished Report.' (DEGW, 1972).

3. See Amy Thomas, 'Prejudice and Pragmatism: The Commercial Architect in the Development of Postwar London', *Grey Room*, 71 (2018), 88–115; Nicholas Bullock, 'The Revival of Private and Commercial Practice', in *Building the Post-War World: Modern Architecture and Reconstruction in Britain* (London: Routledge, 2002), pp. 245–76.

4. David Harvey, 'From Managerialism to Entrepreneurialism: The Transformation in Urban Governance in Late Capitalism', *Geografiska Annaler. Series B, Human Geography*, 71.1 (1989), 3–17.

5. For the specific transformations in financial services and their relation to built change, see Francis Duffy, *The Changing City* (London: Bulstrode Press, 1989).

6. See Linda McDowell, *Capital Culture: Gender at Work in the City* (Oxford: Blackwell, 1997).

7. DEGW and EOSYS Ltd., 'The ORBIT Study', A1.

8. Duffy in Wolfgang Preiser, *Professional Practice in Facility Programming* (London: Routledge, 2015), p. 90, fn 5.

9. F. J. Langdon and Building Research Station (Great Britain), *Modern Offices: A User Survey*, National Building Studies. Research Papers, no. 41 (London: H.M.S.O., 1966); A. W. W. Robinson, 'Working in The City', *Occupational Medicine*, 15.1 (January 1965), 42–56; Pilkington Research Unit, University of Liverpool, Department of Building Science, *Office Design: A Study of Environment*, ed. by Peter Manning (Liverpool: University of Liverpool, 1965); Peter Cowan and Daniel Fine, *The Office: A Facet of Urban Growth*, Report of the Joint Unit for Planning Research, University College London and the London School of Economics (London: Heinemann Educational, 1969).

10. For an account of this research see Francis Duffy, 'Architects and the Social Sciences', in *Architectural Knowledge: The Idea of a Profession*, ed. by Francis Duffy and Les Hutton (London: E & FN Spon, 1998 [1968]), pp. 8–21; Francis Duffy, 'Petrified Typologies', in Duffy and Hutton, *Architectural Knowledge* [1969].

11. Duffy in *Architecture from the Outside in: Selected Essays by Robert Gutman*, ed. by Dana Cuff and John Wriedt (New York: Princeton Architectural Press, 2010), p. 210.

12. Duffy, 'Architects and the Social Sciences', p. 10.

13. Ibid., p. 11.

14. See Christopher Alexander, *The Timeless Way of Building* (New York: Oxford University Press, 1979); Duffy, 'Architects and the Social Sciences', p. 11.

15. Duffy, 'Architects and the Social Sciences', p. 11; *Architecture from the Outside in*, p. 210.

16. For an analysis of this phenomenon in the US, see Reinhold Martin, *The Organizational Complex: Architecture, Media, and Corporate Space* (Cambridge, MA: MIT Press, 2003).

17. Cowan and Fine, *The Office*; Pilkington Research Unit, *Office Design*.

18. See Adam Sharr and Stephen Thornton, *Demolishing Whitehall: Leslie Martin, Harold Wilson and the Architecture of White Heat* (London: Routledge, 2016).

19. The acknowledgement also recognises the importance of innovations in bürolanschaft (office landscaping) by the Quickborner Team and the Scheller brothers in Germany. Francis Duffy, Colin Cave, and John Worthington, *Planning Office Space* (London: Architectural Press, 1976), p. 1.

20. *Architecture from the Outside in*, p. 210.

21. DEGW and EOSYS Ltd., 'The ORBIT Study', A2.

22. Ibid., p. 61.

23. Duffy, 'Architects and the Social Sciences', p. 12.

24. In particular, the report claimed that as staff became more skilled and 'more demanding in their expectations and requirements', then the preferences of the user more generally would become significant, including: installing floor plans with more a cellular arrangement and meeting space in place of open plan offices, which were often the subject of complaint; emphasising the worker's control over the 'micro environment'; and giving employees the right to external views. DEGW and EOSYS Ltd., 'The ORBIT Study', p. 36.

25. Francis Duffy, 'A Case for More Collaboration' in *Architectural Knowledge* ed. by Duffy and Hutton [1986], p. 97.

26. DEGW and EOSYS Ltd., 'The ORBIT Study', pp. 80–101.

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27. Ibid., p. 102.

28. Amy Thomas, 'The Political Economy of Flexibility: Deregulation and the Transformation of Corporate Space in the Post-War City of London', in *Neoliberalism: An Architectural Project*, ed. by Kenny Cupers, Helena Mattsson, and Catharina Gabrielsson (Pittsburgh: Pittsburgh University Press, 2019).

29. Duffy, 'A Case for More Collaboration'.

30. Susan S. Fainstein, *The City Builders: Property, Politics, and Planning in London and New York* (Oxford: Blackwell, 1994), p. 108; Harvey, 'From Managerialism to Entrepreneurialism', p. 4.

31. As Fainstein notes, 'while ultimately responsible to public elected officials, UDCs operate much like private firms, employing the entrepreneurial styles and professional image-building techniques more customary in the corporate than in the governmental world.' Fainstein, *The City Builders*, pp. 7, 107.

32. Thornley in *Urban Planning and the British New Right*, ed. by Philip Allmendinger and Huw Thomas (London: Routledge, 1998), p. 220.

33. Fainstein, *The City Builders*, p. 107.

34. The Labour government had catalysed similar efforts with the 1978 Inner Urban Areas Act, which attempted to encourage partnerships between the state and private businesses to stimulate employment and development. Fainstein, *The City Builders*, p. 108.

35. Alan Prior, 'UK Planning Reform: A Regulationist Interpretation', *Planning Theory & Practice*, 6.4 (December 2005), p. 475.

36. DEGW and EOSYS Ltd., 'The ORBIT Study', B3.

37. Urlan Wannop, 'The Evolution and Roles of the Scottish Development Agency', *The Town Planning Review*, 55.3 (1984), p. 315; Duffy in Preiser, *Professional Practice in Facility Programming*, p. 89.

38. Allmendinger and Thomas, *Urban Planning and the British New Right*, p. 211; Michel Foucault, *The Birth of Biopolitics: Lectures at the Collège de France, 1978–79*, ed. by Michel Senellart, trans. by Graham Burchell (Basingstoke: Palgrave Macmillan, 2008), p. 132.

39. Prior, 'UK Planning Reform', p. 475.

40. According to Wetherell, in addition to such incentives, 'the removal of all fire and building regulations, bus and taxi licensing and even suspension of laws forbidding "sex and racial discrimination" were discussed but never implemented.' Sam Wetherell, 'Freedom Planned: Enterprise Zones and Urban Non-Planning in Post-War Britain', *Twentieth Century British History*, 27.2 (June 2016), 276–7.

41. Wetherell, 'Freedom Planned', p. 276.

42. Quoted in Ibid., p. 278.

43. Kevin Morgan, 'Digital Highways: The New Telecommunications Era', *Geoforum*, 23.3 (1992): 319.

44. Barney Warf, 'Telecommunications and the Globalization of Financial Services', *The Professional Geographer*, 41.3 (1989), 259; Morgan, 'Digital Highways', p. 320.

45. London Business School, *The Competitive Position of London's Financial Services: Final Report*, *City Research Project* (London: Corporation of London, 1995), section 6; Morgan, 'Digital Highways', p. 320.

46. Morgan, 'Digital Highways', p. 320; For an in-depth account of the logistics of installing the new telecommunications infrastructure and its politics, see Stephen Graham and Simon Marvin, *Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition* (London: Routledge, 2001), pp. 318–23.

47. DEGW and EOSYS Ltd., 'ORBIT Appendix 2: The Organisational Case Studies', in 'The ORBIT Study', p. 1; Fainstein, *The City Builders*, p. 3.

48. Harvey, 'From Managerialism to Entrepreneurialism', p. 9.

49. DEGW and EOSYS Ltd., 'The ORBIT Study', p. 4.

50. Alastair Ross Goobey, *Bricks and Mortals: Dream of the 80s and the Nightmare of the 90s – Inside Story of the Property World*, 2nd edition (London: Random House Business Books, 1993), pp. 27–28.

51. Goobey, *Bricks and Mortals*, p. 28.

52. For a detailed account of the way that technology and political-economic transformations removed the emphasis on location in the City of London, see Michael Pryke, 'An International City Going "Global": Spatial Change in the City of London', *Environment and Planning D: Society and Space*, 9.2 (1991), 197–222; Amy Thomas, 'Offshore City: The Regulatory Space of Finance and the City of London', in *The Architecture of Industry: Changing Paradigms in Industrial Building and Planning*, ed. by Mathew Aitchison (Burlington, VT: Ashgate, 2014), pp. 137–64.

53. Warf, 'Telecommunications and the Globalization of Financial Services', p. 266.

54. Goobey, *Bricks and Mortals*, p. 41; Peter Scott, *The Property Masters: A History of the British Commercial Property Sector* (London: E & FN Spon, 1996), p. 219.

55. Duffy, 'A Case for More Collaboration', p. 97.

56. Prior, 'UK Planning Reform', p. 475; Scott, *The Property Masters*, p. 219.

57. Scott, *The Property Masters*, p. 223.

58. Fainstein, *The City Builders*, p. 198; Mark Harvey, 'The United Kingdom: Privatization, Fragmentation and Inflexible Flexibilization in the UK Construction Industry', in *Building Chaos: An International Comparison of Deregulation in the Construction Industry*, ed. by Gerhard Bosch and Peter Philips (London: Routledge, 2003), p. 201.

59. Maxwell Hutchinson, 'Stuart Lipton Interviewed by Maxwell Hutchinson', in *Paternoster Square and the New Classical Tradition*, Architectural Design Profile 97 (London: Academy, 1992); Goobey, *Bricks and Mortals*, pp. 65–84.

60. Lionel Brett, 'The Developers', *Architectural Review*, 140.823 (1965), 165.

61. DEGW and EOSYS Ltd., 'The ORBIT Study', p. 2; Francis Duffy, *The Changing Workplace* (London: Phaidon, 1992), p. 227.

62. Duffy, 'A Case for More Collaboration', p. 113.

63. Ibid., p. 113.

64. See Graham Ive, 'Commercial Architecture', in *Architecture and the Sites of History: Interpretations of Buildings and Cities*, ed. by Iain Borden and David Dunster (New York: Whitney Library of Design, 1996), pp. 375–82.

65. Tim Brindley, Yvonne Rydin, and Gerry Stoker, 'Popular Planning: Coin Street, London', in *Remaking Planning: The Politics of Urban Change* (London: Routledge, 2005), pp. 60–76.

66. Goobey, *Bricks and Mortals*, p. 71.

67. Despina Katsikakis, interview by Amy Thomas, 2 February 2018.

68. See Thomas, 'Prejudice and Pragmatism'.

69. Alan Powers, *Britain*, Modern Architectures in History (London: Reaktion, 2007), p. 225.

70. John Worthington, 'IT: A Creative Challenge. Spinning out of ORBIT', *Architects' Journal*, 9 (February 1992), 47.

71. Ruth Slavid, 'Taking a Client's Eye View', *Architects' Journal*, 4 November 1996, p. 43.

72. Andrew Harrison, 'The Intelligent Building in Europe', *Facilities*, 10.8 (August 1992), 15. ORBIT 2 was conducted by DEGW, Harbinger, and FRA in the context of North America. A summary report by Franklin Becker, Gerald Davis, Francis Duffy and William Sims was published by Harbinger (a subsidiary of the Zerox corporation) in 1985.

73. Slavid, 'Taking a Client's Eye View', p. 43.

74. John Worthington. 'IT: A Creative Challenge Spinning out of ORBIT', *Architects' Journal*, 3 September 1992, p. 47.

75. Slavid, 'Taking a Client's Eye View', p. 43.

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76. DEGW and EOSYS Ltd., 'The ORBIT Study', p. 101.

77. Frank Duffy, 'The Origins of Facilities', *Facilities* 25.11/12 (August 2007).

78. See Thomas, 'The Political Economy of Flexibility'.

79. For an overview of the workings of DEGW, see Kenneth Powell, *Design for Change: The Architecture of DEGW* (Basel: Birkhäuser, 1998).

80. Slavid, 'Taking a Client's Eye View', p. 43.

81. John Worthington, interview by Amy Thomas, 15 February 2018; DEGW and EOSYS Ltd., 'The ORBIT Study', A3.

82. DEGW and EOSYS Ltd., 'Rosehaugh Greycoate Estates: Report Entitled Finsbury Avenue and the ORBIT Report For the Directors of Rosehaugh Greycoat Estates Ltd.', London: DEGW Group, 6 June 1983, DEGW/A/245/1, DEGW Archive; DEGW, 'Stanhope Properties Plc.: Report Entitled Learning from Stockley and Broadgate', London: DEGW Group, 10 January 1990, DEGW/A/277/4, DEGW Archive.

83. Duffy in Preiser, *Professional Practice in Facility Programming*, p. 91.

84. Stephen Bradley, 'The Workplace Forum, 1991–1998'. DEGW Symposium, University of Reading, 2017.

85. Worthington, interview.

86. Katsikakis, interview.

87. Sir John Soane, 1788, quoted in Francis Duffy and Andrew Rabeneck, 'Professionalism and Architects in the 21st Century', *Building Research & Information*, 41.1 (February 2013), 116. The authors acknowledge that today this imperative is reversed: the architect should protect the client against the construction giants that dominate the industry.

88. Duffy and Rabeneck, 'Professionalism and Architects in the 21st Century', p. 117.