



An integrated approach to healthcare facility design

ISQua Conference, 2009

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Areas for discussion

- Traditional approaches and issues/risks
- Challenges in designing healthcare facilities today
- Integrated Team approach and benefits
- Concept design development
- Maintaining safety and quality during design
- Case study/examples

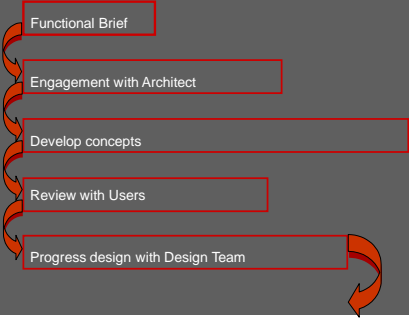
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Traditional Methods

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Traditional approach to design development



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graph TD
    A[Functional Brief] --> B[Engagement with Architect]
    B --> C[Develop concepts]
    C --> D[Review with Users]
    D --> E[Progress design with Design Team]
  
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Traditional approach....key issues

- Key decisions already made on building form and layout.
- Engineering solutions applied retrospectively – not developed interactively
- Standardisation may not be as readily achievable
- Can result in unwanted noise and vibration (due to system design and equipment locations)
- Can reduce potential for natural light and ventilation
- Can impact on energy use
- Can impact on the design of critical areas such as OT/ICU etc

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This can result in....

- Adaptability and flexibility impeded due to lack of hospital process knowledge and future requirements
- Inefficient use of facility due to less than optimal designs
- Potential increase in lengths of stay due to less than optimal environmental conditions
- Lack of standardisation leading to risk of errors
- Poorly designed critical areas as a result of late structural and M/E involvement

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Challenges

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Challenges for today's healthcare facilities

- Increasing complexity of healthcare buildings
- Flexibility and adaptability
- Developing medical + information technology
- Hospital acquired infections (MRSA, etc.)
- Pandemics, new diseases
- Funding, operational budgets
- Patient choice / patient environment
- Using healthcare assets more effectively and intensely
- Sustainability
- Regulatory & Legal

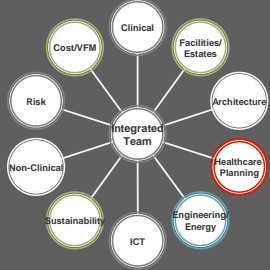
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The Integrated Approach

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The Integrated Team - key components



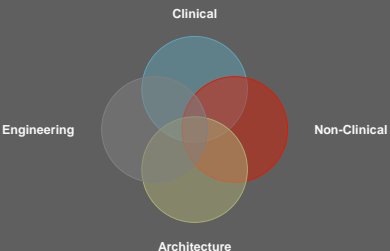
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Integrated Team benefits

- Reduces fragmentation associated with traditional approach
- Establishes key relationships early and reduces conflict between clinical/architectural/engineering professionals
- Promotes collective responsibility for design solutions
- Brings previous experience to the table early
- Key hospital processes described and understood by all from the start
- Enables facility design to grow organically so that building, structure and systems are built around the processes they serve – leading to improved quality and safety.

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Key Interfaces to support hospital processes



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Key Interfaces

- Areas of commonality intersect around healthcare processes and services to be delivered
- Identify early at project initiation stage
- Enables design activities to commence on the right track
- Key drivers/principles agreed as a team (eg: flexibility, sustainability, ICT, budget)

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Concept Design

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Integrated Approach to Concept Design

- Assess design brief collectively for key safety and quality drivers
- Builds on site master planning principles
- Develops solutions based on key hospital processes initially
- Promotes cross-specialty and inter-discipline consultation
- Brings together full spectrum of design standards, guidelines and best practice from the start
- Establishes design co-ordination process early

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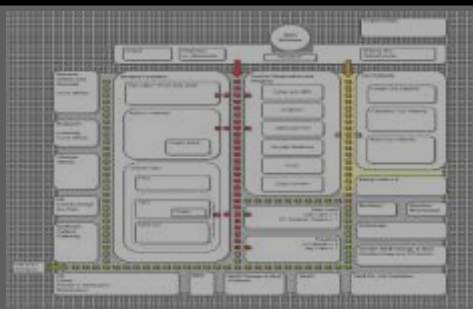
Design solutions centred on hospital processes

- Determine and agree key hospital processes with Integrated Team
- Supports a systematic approach to design development
- Can test best options from a hospital wide perspective first (before departmental internal design)
- Begins with schematic approach
- Allows multiple design iterations at relatively low cost
- Can proceed to next design stages with degree of confidence/certainty

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Example of schematic for acute facility



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Further advantages...



- Integrated team define and agree assessment criteria
- Allows preliminary modelling to consider multiple parameters such as travel distances, adjacencies, energy use, natural light, natural ventilation
- Enables early equipment and technology planning – integrated into the design
- Identifies, in collaboration with users, critical areas and systems
- Allows failure analysis to be performed early to identify risks

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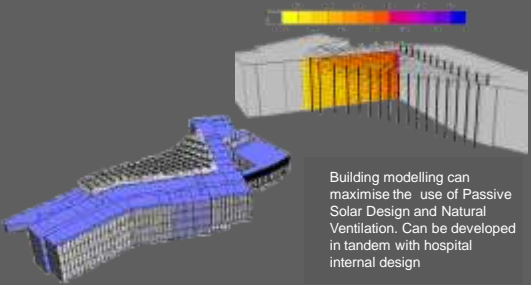






Building Modelling


Modelling...



Building modelling can maximise the use of Passive Solar Design and Natural Ventilation. Can be developed in tandem with hospital internal design

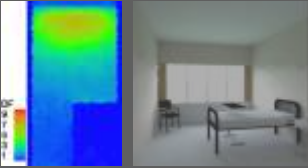





Modelling.....benefits



Interactive Modelling to dynamically test:

- Clinical (travel distances, visibility, flows)
- Architectural (natural light, functionality)
- Engineering (energy use, ventilation strategies)







Maintaining safety and quality principles throughout the design process




Key Areas

- Structured Reviews against agreed criteria and principles
- Integrated building modelling for complex projects
- Co-ordination workshops
- Room mock-ups as soon as possible
- Formal design qualification of critical areas against agreed protocols – eg: ICU, Theatres, Isolation rooms, Labs



Supporting statements




Evidence that supports integrated design approach

- Latent conditions can arise from poor design and management decisions: lack of standardisation, poor visibility, high noise levels
- Technological/Service developments and demographic changes all require facilities to be more adaptable and flexible
- Automation of processes can lead to improved quality and safety – but need to be integrated early
- Integrated Building Modelling delivers more efficient use of space, reduced construction and operational costs
- Building operation can be improved through co-ordinated designs

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Case studies & examples

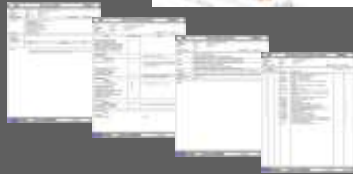
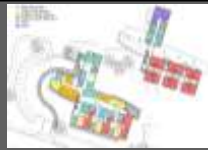
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The Integrated Team - Approach to your project -

Briefing and design process

- functional content
- schedule of accommodation
- functional adjacencies
- room relationship layouts
- room by room brief
- fully loaded room layouts



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Tidworth Garrison Primary Care Centre

- Prime Contracting
- Defence procurement
- Supply chain team
- 3 Stage process
- Integrated from day 1
- Engineered design
- Package disciplines

Added Value

- Exactly what it says on the tin
- Zero defects – no intrusion
- Bang on programme



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Shannon Clinic Regional Medium Secure Unit Belfast



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Shannon Clinic Regional Medium Secure Unit Belfast

- Performance Related Partnering
- Ideas competition
- Fee fixed by client
- Development of the brief with client, architect and engineer
- Marriage of healing environment with engineering
- Integrated arts programme
- Client requirements defined before construction design
- Commended design



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Barts and London Hospital PFI Project

- Largest PFI Hospital
- Barts = 50,000 sq m
- €933m
- Intense tertiary
- Complicated
- PFI Competition
- Output Specifications
- Integrated solutions



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Barts and London Hospital PFI Project

- Preferred Bid Process
- Innovation
- Flexibility and Future proof
- Health Planning
- Shell and Core
- Structures
- Engineering services
- Systems

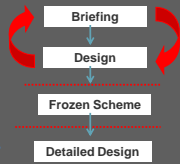


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Added Value of Integrated Design.....

- Team strength
- Experience
- Innovative + creative solutions
- Flexibility, respond to change
- Knowledge + Enthusiasm
- Award winning design
- Design and Delivery
- Understanding the clients requirements
- Ideas.....



Construction Information
Loaded room layouts
Specification
Components
Details
Fully coordinated
Market testing + GMP

fully designed, costed, buildability, life cycling, market testing, design, client + contractor reviews

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