

**Can specification and design
constraints achieve user
satisfaction of energy efficient
lighting control?**

User Satisfaction

- What does this mean?
 - The lighting control fulfils the needs
 - User input is obvious and intuitive
 - Control is without hindrance
 - can do rather than can't do
 - Auto responses are as expected
 - “no surprises”
 - Operation seems natural & enhances the user space

The Lighting Control (fulfils the needs)

- What is needed to be achieved?
- How is the system being sold?
- Are energy savings the priority?
 - Or a system that can also save energy?
 - Can this be the same?

The Needs [As seen by the customer]

- The customer (specifier)
 - Energy efficient office
 - daylight harvesting
- Control
 - Constant LUX with closed loop operation
- Initial result
 - Significant drop in energy use

The Needs [As experienced by the User]

- In operation
 - Change of shadow direction
 - Change of colour temperature
 - Fast response to daylight change
- User satisfaction
 - None
- Long term result for customer
 - System overridden, no energy saving
 - Wasted capital investment
 - No desire to repeat the mistake

User Input

- Do we need any?
 - Specifier knows best
 - Can we trust the user?
 - Alienation of user is a risk without any
- Obvious
 - A UK light switch is down for ON
 - A European switch is UP
- Intuitive
 - Is this possible without prior experience?
 - Familiarity to similar circumstances/situation

Without Hindrance

- Key link to expectations
 - Realistic need
 - Absence of spurious thinking
(don't expect your car to fly!)
 - Does this mean user education
- Deliver well within workable parameters
 - Remove “if only” ’s
 - Limited by technology
 - Not cost or
 - Commercial limits

Automatic Responses

- Issue of expectations
- Positive experience
 - Lights turn on when entering room
- Eliminate negative experiences
 - Lights turning off whilst still in a room
- Allow user interaction/modification
(where appropriate)
 - Control of personal space
 - Self learning response to user

Enhancing the user space

- Understanding the psychology of the interaction
 - Improved environment for the user
 - positive experience
 - role of aesthetics
 - physical comfort
 - Natural operation becomes transparent to user
 - Unaware of its operation

Specification

- Commercially the Customer is seldom the User
 - Has to satisfy the desires of the Customer and encompass the needs of the User
- At the time of specification the User as such may not exist and lacks representation - standards?
- Standards cover basics only
 - Need application and implementation Standards [The world has learnt “Microsoft™” is it time to learn energy management?]

Design Constraints

- The Lighting Control Design needs to take care of the User, regardless of the specification
 - Functional to the User
 - Straight forward in operation - avoid complications
 - Flexibility in the parameters offered
 - Self steering User input to ensure correct use
- Long cycle time due to capital investment, unlike consumer products difficult to get quick feedback

Summary

What does all this mean?

- None of the issues are new, yet remain equally valid today
- Specification is frequently poor, lacking understanding of the technology and the interaction of the User
- Proof of design has a long gestation period making progress slow - lessons seem to be re-learnt
- Industry sectors (specifiers, manufacturers, installers) work independently
- What are the rules?

Conclusions

Current practice remains a barrier to achieving our goal

- Poor dissemination of information
 - Need to broaden awareness
 - Develop serviceable standards
- The right control equipment incorrectly installed or used can be worse than no control
- Current specification is Industry led - can we achieve more by being customer led, and if so how do we provoke the customer drive to commercial success?
- Until a holistic approach is commonplace success may be reliant upon the actions of the controls manufacturer