Human Factors Integration in healthcare

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SUMMARY

The integration of human factors is relatively immature in healthcare compared to other safety critical industries. This paper aims to transfer knowledge from these industries for human factors healthcare practitioners. The paper includes practitioner experience and the need to recognise the soft systems with Human Factors Integration as a goal to inform Human Factors activities.

KEYWORDS

Human Factors Integration, soft systems, knowledge transfer

Introduction

The UK healthcare system has steadily been applying human factors (HF) to pockets of organisational processes; including investigations, simulation, equipment design and testing work processes (O'Dea et al, 2025). This current paper is a response of the call from Kirwan (2000) to share learning on how to achieve a 'HF-friendly culture'. Kirwan's paper considered the context and three phases to the lifecycle of HF integration (HFI) into industry. His framework has been applied as the basis for knowledge transfer on HFI from other industries into healthcare.

In 2023 the role of Head of Human Factors was created at a large acute NHS Foundation trust in Bristol. The goal of the role was to integrate human factors within the NHS Trust. A HF Faculty was created with the appointment of a further qualified HF professional within the first year. This current paper describes first hand experiences in the integration of HF into a large acute teaching hospital. This reflects on how and where HF professionals have gained the greatest opportunities and the context of soft systems that influence integration.

Soft systems

The term soft systems is a description of the social and technical aspects of a system and treating the two as being intrinsically linked to provide better system design solutions (Checkland, 2000). Any HF practitioner will recognise this and know that delivering HF is as much about their knowledge on HF as their ability to understand the organisational context and working out how to get things done to demonstrate impact on organisational priorities.

Human Factors Integration

The lifecycle of Human Factors Integration (HFI) refers to how long it takes to develop and demonstrate HF is integrated into a system. An early HF strategy presented the vision of HFI across existing organisational processes as the goal of the HF faculty. The approach for evaluation of this goal was illustrated through the use of a HFI maturity model (Edmonds et al, 2019). Annually case studies, of HF activities supporting four different workstreams aligned to the strategy, are mapped against the maturity model and reflect HF impact against organisational priorities. This evidences HF integration and identifies gaps to inform the HF strategy and priorities.

Three phases to integration

Kirwan (2000) suggests it takes approximately three years to achieve the three phases of integration including: phase 1 - proving, phase 2 - initial integration and expansion and phase 3 - consolidation and integration. The authors agree with this 3-year duration for HFI but also recognise that Kirwan's observation of it may take 'quite a bit longer' as applicable. This avoids overconfidence or complacency by the authors in the sustainability of level of integration achieved so far.

Phase 1: the recruitment of a Head of Human Factors implies some of the work to prove the need for HF had already been achieved by a handful of well-informed senior leaders. However, in the size and siloed nature of healthcare promoting the need for HF was still essential. Early ethnographic work helped to understand the organisation and early engagement with senior leaders and Executives ensured an opportunity to deliver an elevator pitch tailored to different priorities. Identifying organisational priorities and risks informed the development of a HF strategy which included equipment procurement, safety within patient safety activities, workforce fatigue management and HF capacity. The strategy clearly visualised these four workstreams and was used to widely communicate the goal of HFI and the identification of initial HF projects.

Phase 2: early projects provided a vehicle for the integration of HF into existing processes that identified and sought to address safety and performance issues. Early work with receptive teams, provided opportunities to apply HF methods to prospectively review safety critical activities i.e., theatre checks, patient identification, medication safety. Further examples of HF engagement included developing user requirements for redesign of departments, informing organisational policies and procedures, process and development of local risk mitigation actions. An emergent area of work has been seen in the request for safety reviews of digital interfaces. Initial presentations to senior leaders included the need for HF to support procurement and selection of equipment. This was met with 'that's not HF.' Misunderstanding of HF as being solely "about the human" was addressed using systems methods, including the Functional Resonance Analysis Method (FRAM), to model equipment procurement processes. This visualised specific organisational risks and the need for system design to address them, leading to escalation of the work to an organisational priority project. The development of a new systems-focused programme of work on workforce fatigue has also aligned with organisational priorities for staff retention. Historically focused on individual support, organisational risks are now recognised through a systems approach.

Phase 3: although early in phase 3 planned organisational changes and increasing demand on the HF faculty has required a review of the HF strategy. The evidence of integration includes the transformation team (previously quality improvement) sending all staff through the accredited HF champions course delivered by the HF faculty. Further signs of the HF faculty impact resonate with Kirwan's observations on successful integration, as both HF professionals now lead organisational wide projects, reflected in the HF strategy, which include the procurement project and following a successful external grant the pilot of a fatigue risk management programme. External publications have also supported the internal HF faculty reputation.

This paper reflects on the practical application of a HFI framework and recommend its use by healthcare HF practitioners. The authors also reflect that consideration to the soft systems has been essential but advise healthcare HF practitioners to take account of the regular frequency in which organisations reorganise or adapt to external influences. The HF practitioner needs to be alert to this and adapt HFI strategy to be resilient to such organisational turbulence, whilst agile to respond to the emerging opportunities within healthcare's complex adaptive sociotechnical systems.

References

Checkland, P (2000). Soft systems methodology: a thirty year retrospective. Systems Research and Behavioral Science 17(S1): S11–S58

Edmonds, J., and Gray, K., Assessing Human Factors Maturity., Chemical Engineering Transactions, 77, 481-486, doi:10.3303/CET1977081

Kirwan, B (2000). Soft systems, hard lessons, Applied Ergonomics, 31,6, Pages 663-678, doi.org/10.1016/S0003-6870(00)00041-7

O'Dea A, Sharafkhani M, Codd M, Browne, M, O'Connor, P and Ward, M.E (2025). Principles for the conduct of human factors/ergonomics in healthcare: a scoping study of the published evidence. BMJ Open Quality 14, doi:10.1136/ bmjoq-2024-003222