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Electronic Patient Records Across the Care Continuum

The National Health Service (NHS) in the UK is moving towards vertical integration of its healthcare services as exemplified by the 'Integrated Care Pilot Programme' launched by the Department of Health in October 2008. Vertical integration is where the full range of health providers (hospital and community services, GPs, mental health providers, home health services, social services, etc.) in a geographically contiguous region, such as a health economy or care community, join together to deliver services in a patientcentric manner. This type of integration requires collaborative clinical service delivery integration with or without corresponding organisation integration. The main principle of this paper is: integrated care organisations require integrated information systems, in particular integrated Electronic Patient Record (EPR) systems.

The Electronic Patient Record (EPR) systems market is becoming active again in the UK after several years of being dormant. The reason is that the National Programme for IT (NPIIT) is severely delayed in delivering EPR solutions and hospitals are looking outside of NPIIT for alternatives. To help hospitals re-enter the EPR market, it is useful to understand the shape of the EPR market today and where it is going in the future.

The EPR Market in the UK

The customer market for hospital EPRs in the UK is classified into 3 tiers according to the hospital's underlying business model.

Tier I hospitals adopt a "Hospital Departments" business model and view EPRs as a technology to maintain hospital operations and activity reporting by replacing aged (and/or introducing new) PAS (Patient Administration System) and departmental systems such as A&E (Accident and Emergency), maternity, operating theatres, cancer, pharmacy, etc.

Tier II hospitals adopt a "Hospital Integration" business model and view EPRs as a technology as well as an organisational change agent for improving (or transforming) the way the hospital does business, integrating processes across departments, improving the quality of care in multidisciplinary ways and improving the safety and experience of patients across the patient journey through the hospital.

Tier III hospitals follow a "Vertical Integration" business model and view EPRs as a technology, an organisational change agent, and a tool that supports the vertical integration of care with other healthcare organisations across the local care community or health economy. The EPR is a collaborative tool for supporting, and indeed stimulating, integrated care across care settings and care organisations, in the manner of an Integrated Care Organisation (the new pilot programme established by the Department of Health in late 2008). Kaiser Permanente and Intermountain Health in the US exemplify the Tier III hospital business model.

The supplier market for EPRs is classified into 3 corresponding product segments and supplier business models:

Type I EPR suppliers follow the "Best of Breed" business model and develop EPR products to meet the demands of

Tier I hospitals. They offer collections of departmental systems and an interface engine to exchange patient, orders and results data using HL7 messaging. They tend to offer more decision support functionality within, and less across, departments.

Type II EPR suppliers follow the "Integrated EPR" business model and develop EPR products to meet the demands of Tier II hospitals. They offer an integrated suite of EPR modules that satisfy the needs of hospital departments AND provide an additional level of crossdepartment or enterprise-wide (i.e. integrated) benefits such as: (a) hospital-wide decision support; (b) hospital-wide scheduling; and (c) hospitalwide integrated care pathways.

Type III suppliers follow the "Vertical Integration EPR" business model and develop EPR products to meet the demands of Tier III hospitals and other healthcare organisations. There are no 'pure-play' Type III EPR suppliers in the UK but some of the more established Type II suppliers are likely to claim that they already have Type III EPR products available, particularly from their overseas product catalogue, but have not sold them in the UK due to lack of sufficient Tier III demand.

EPR Impact on Quality of Care

There are 4 critical success factors that enable EPRs to improve the quality of care. EPRs need to:

- (a) Be intelligent (i.e. offer advanced real-time and proactive clinical decision support);
- (b) Offer deep integration (i.e. functions need to be integrated seamlessly by design and at all levels of EPR function);
- (c) Be detailed (i.e. the full set of up to date and relevant clinical details need to be available, not just a subset where important clinical data will regularly be missing), and
- (d) Be cross-setting (i.e. operate wherever the patient is, not just within the bounds of certain organisations or clinical offices).

These critical success factors highlight the need to ensure 'materiality of impact' when designing and deploying EPR systems. EPR benefits (such as reducing adverse drug events and medical errors, improving patient safety, enhancing the patient experience, improving outcomes) need to be measured in terms of [level of benefit from EPR] x [numbers of patients likely to benefit from EPR]. Applying Type III systems across a care community is more likely to achieve a HIGH [level of benefit], based on research evidence, and for HIGH [numbers of patients likely to benefit]. Summary records, or passive clinical data repositories have low impact because they lack detail and intelligence.

Most hospitals in the UK drift along as Tier I hospitals and consider Type I EPRs to be sufficient for their needs. Many hospitals have slowly progressed to Tier II mind-sets and can see the benefits of the well integrated Type II EPRs as promised by the LSPs for the past 6 years. However, the greater benefits underlying integrated care and Tier III hospital business models are beginning to be recognised by a few hospitals (and associated organisations). These benefits should be stimulated and realised.

There is a growing trend to discharge patients from hospitals back to their homes so that they are rehabilitated in a familiar environment. Such trends require Type III systems that operate across healthcare providers and enable clinicians (e.g. nurses, GP's, therapists) to deliver treatment seamlessly across acute, community and primary care settings. Chronic diseases also require Type III EPRs with clinical pathway and case management functions. Over the years there has been a proliferation of disease specific solutions but which do not work across the care continuum (they are Type II and not III).

The key conclusions from the above considerations are:

1. Healthcare needs to be more patient-centric. Hospitals should think Tier III and plan for local vertical integration in clinically and organisationally practical ways. The Darzi Review's clinical pathways are an expression of this objective. Virtual care teams at the clinical pathway level should work across care settings in multidisciplinary ways. To facilitate such collaborative working, hospitals and other providers should form EPR procurement consortia and share in the design, costs and benefits of Type III EPR systems.
2. The higher the EPR Type the higher the quality of care but also the higher the quality of information that will be generated as a by-product of that improvement. Reliable information is best obtained from systems that are relied upon.
3. EPRs should be procured against a local EPR vision and strategy. Years of frustration and disillusionment have led to disinterest in IT strategy at local levels. This trend must be reversed so that the progression from Type II to Type III systems can be designed, developed and deployed.
4. Type III EPRs should be sought directly from EPR suppliers, not the LSP. The LSP model of EPR deployment has failed because LSPs lack EPR experience and interfere with the EPR customer/EPR supplier relationship.
5. In the future higher tiers of EPR demand will emerge including EPRs that work across geographies (e.g. Tier IV: National EPR needs) and Tier V: Global EPR needs). Corresponding EPR types will emerge to meet this demand. In any case, the EPR is more than just a 'record'; it offers intelligent and proactive functionality that will guide and predict care across patient populations, clinicians, organisations and countries.
6. Bringing data together does not in itself integrate care, either at the organisation, regional or national levels. Deliberate and collaborative efforts to integrate care across local settings, designed around the patient, driven by local care givers, is required first.
7. EPR vendors will not develop new systems until they see real demand from the market. A more cohesive and visionary approach to EPR procurement is therefore needed across care communities (primary, secondary and acute).

EPRs will have the next highest impact on quality of care when Tier III demand is matched by Type III products because that is where integrated products support integrated care. And more integrated care is what patients desire and deserve.

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