Ambient User Experience is taking
'Patient Tracking' and **'Care Management'**
to a whole new level

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experience partnership.

We are in exciting times today... new and improved technology and devices are not only making the impossible possible, but also 'redefining' the experience we have with the products and applications that we interact with on a daily basis. The resultant 'Ambient User Experience' is immensely impacting and influencing today's healthcare products and solutions.

What is making this possible?

Simplified sensor based technology is leading to the use and application of sensors in all walks of life. These sensors are embedded in many technologies and devices that we use personally and professionally, collecting necessary data that has the potential to provide great insights. Further the sensors are programmed to get smarter as they gather more data based on users' daily usage patterns and learn from it. Though the sensors by themselves have the capability to do a lot, they are still working in silos and the true potential of the data collected is not being tapped into. Gartner however predicts that these sensors will increasingly work together in future, leading to even greater insights about our daily patterns and that's when we would be harnessing its true potential.

So what then is Ambient User Experience?

The seamless experience that is derived out of the contextual data gathered by the various devices and sensors in the device mesh, where these devices and sensors are talking to each other is 'Ambient User Experience'. The challenge in designing products and applications with Ambient User Experience is anticipating device synchronicity and collaboration. Industry research predicts that using this data and visualization tools and techniques, the devices and sensors will be able to organize our lives subtly in the background without us knowing they are doing it. So much so that it will become a part of our lives and we may end up depending on it a great deal that we will wonder how we will function without it.

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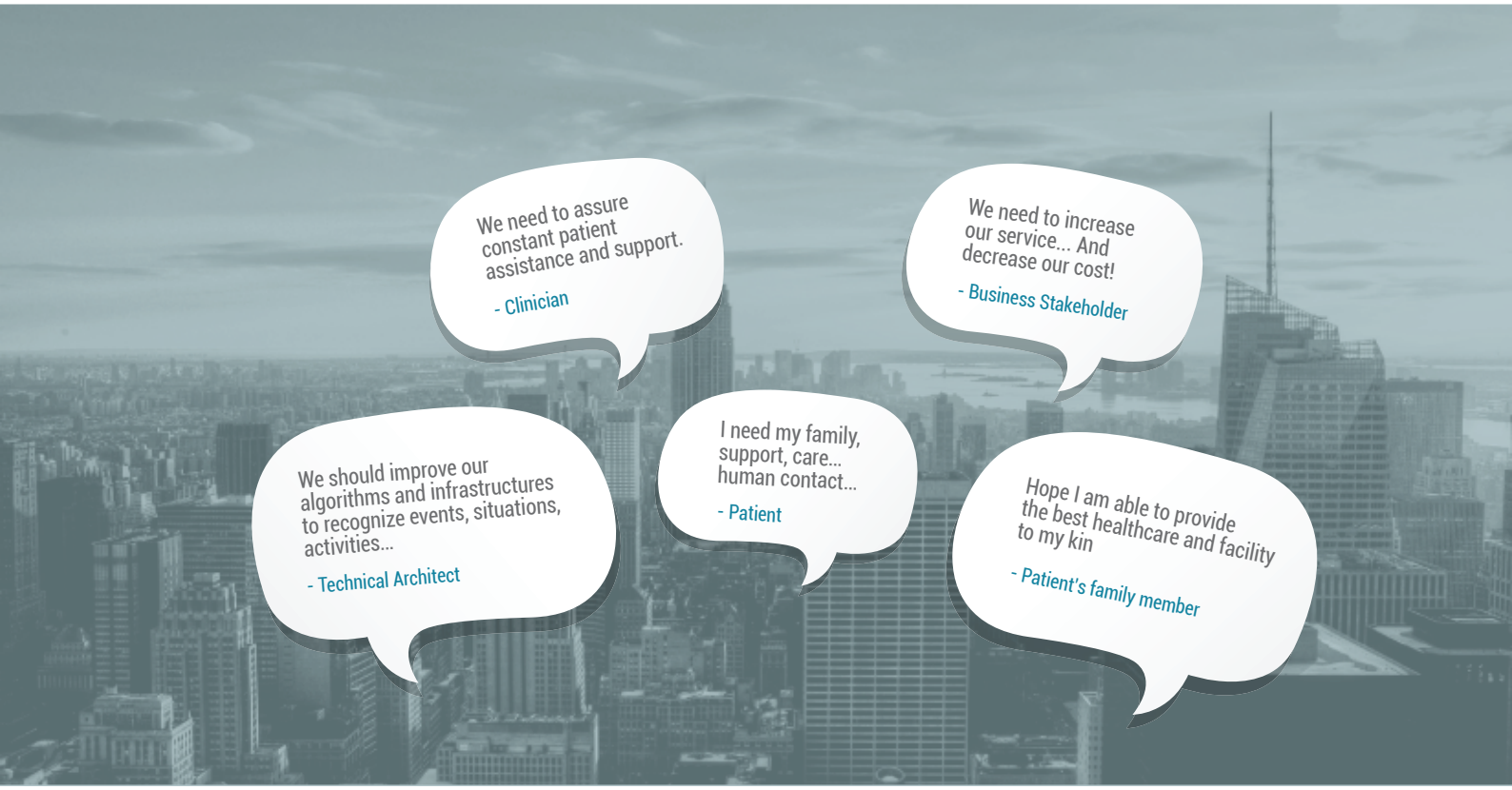
Ambient User Experience in action!

Designing an optimum or ideal experience in healthcare software has always been an interesting but difficult challenge to cater to. One that often cannot do without human intervention due to the limitation of technology, software and the umpteen scenarios, logistics and laws that need to be followed. Therefore a traditional user centered design (UCD) process is not the solution to the problem as UCD looks at an individual (end user's) or group of individuals' needs. What we need here is a much broader approach... which covers the various stakeholders and their needs and interactions in the process. In short it needs to consider 'societal' needs, is more holistic and looks at the integration and interaction between the various sub systems involved. The important thing to note is that there is a need to consider the ways that the social and technical aspects are interdependent and interact, which is central to the performance and behavior of these advanced socio technical healthcare systems.

For instance let's consider the needs of the various 'stakeholders' involved in a typical care management system:



The primary need as defined in the process of creating an Ambient User Experience is to understand the central role of people - which is basically identifying real needs of the stakeholders and users. As we see in some of the statements above - users have very diverse and specific needs. Not only are we required to capture and understand them, we must push their preferences into the system execution to make relevant software products and applications.

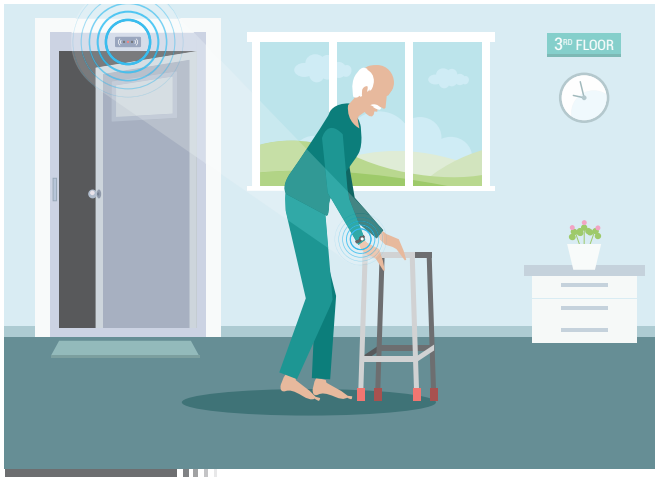
Next would be the environment and the surroundings which need to be considered in the context of the role and activities of people. Contextuality is a critical aspect of Ambient User Experience. Users typically don't think in terms of the context but that needs to be implicitly captured for effective results. Information captured at the right time should appear at the right time, in the right place, in the right context and on the right device for it to make a difference.

As a critical penultimate step, the needs of the stakeholders and users, coupled with the contextuality and need of people, are integrated into the design and the software system is built, tested and made ready to use.

What we see is 'Ambient User Experience' taking patient tracking and care management to a whole new level... as depicted in the subsequent case study.

Category: Resident Care Management

Scenario: The patient in concern is a senior citizen, suffering from a long term degenerative health ailment which has resulted in reduced motor skills and movement, frequent loss of balance, depression, memory loss and other related symptoms. The patient therefore needs constant over sight, monitoring, and regular medication. For effective care management the patient is assigned a care taker who provides oversight on the patient's activities and oversees his medication.



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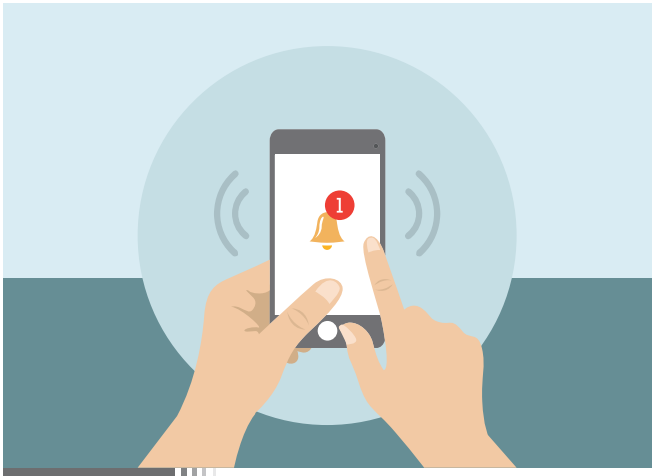
The unattended patient is leaving the room...alone, as the care taker is away attending to other things!

The sensor on the door captures the exit of the patient.



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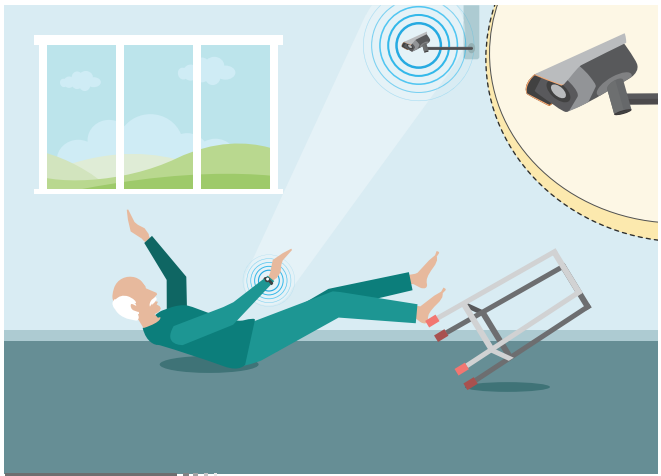
The caretaker gets a mobile alert informing him of the patient leaving the room.

The event is triggered via the interaction of the sensor on the door and the wearable device on the patient.



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The patient has a fall before the care taker can act.

The camera on the hallway catches it.

9:58 PM

The closest nursing care unit is notified (via **SMS, Email, Dashboard**)... who act by deploying helpers immediately to the accident location.

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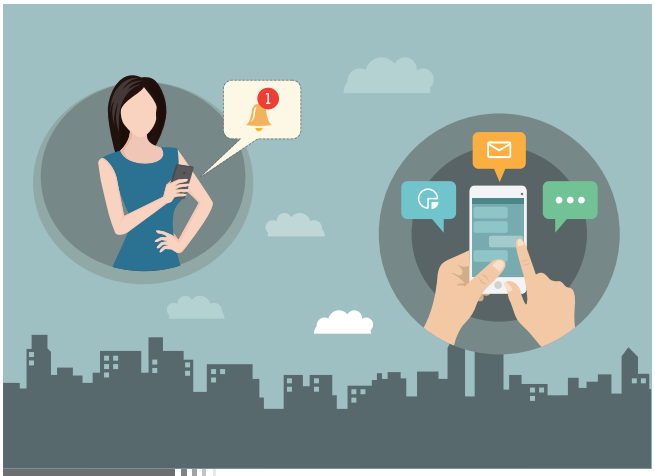
The treating doctor is also sent an alert about the incident. The Doctor calls in to check on the patient and advises necessary care procedure.



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The patient's kin is also informed of the incident (via **SMS, Email, Dashboard**)... who rushes to the hospital.

10:03 PM

The patient is attended to by the helpers and nursing staff and undergoes 'immediate' treatment and nursing care.

10:05 PM

A preliminary report is automatically generated based on the available facts and data and sent to all the necessary stakeholders...

No human intervention is needed!

'Ambient User Experience' has ensured...

EFFECTIVE TRACKING... SWIFT ACTION... INSTANT REPORTING...

all with little or no human intervention while managing stakeholder expectations.

Ambient User Experience saw various devices capturing and sharing contextual information about the patient amongst the devices and systems of various other users/ stakeholders. The interesting thing to note is how human need and intervention is minimized in the use case and was necessary more on a reactive basis when things go wrong and not otherwise. Reflecting on it, don't we want systems with such engaging, reactive and action oriented ambient experiences which takes 'patient tracking' and 'care management' to a whole new level? The answer to that question must surely be a resounding 'Yes'!

The impeding question that arises here is 'whether organizations, technology, users and the law are ready for such systems?' Maybe, maybe not… it is difficult to say but that is not the central focus of this paper. As we observed in the case study, we may not have been able to avoid the accident, but through an efficiently designed monitoring system, alerting system, reporting system put together by an Ambient User Experience which facilitates prompt and targeted action, we can surely manage the situation in a much better way.

In Conclusion

The key to designing and building a healthcare socio technical system that has an Ambient User Experience is understanding that the core problem is not technological in nature. This is often understood as a mindset change of the decision makers in the industry more than anything else. Organizations who have understood this early have made a transformational difference in the healthcare software systems that they have built.

However the good news is that it's never too late to start engaging with your user experience and design team on this or you can get in touch with us at **emids** to bring about the necessary change in how you approach your healthcare systems.

> *"Designing mobile apps remains an important strategic focus for the enterprise, however, the leading edge of that design is focused on providing an experience that flows across and exploits different devices, including IoT sensors, common objects such as automobiles, or even factories. Designing these advanced experiences will be a major differentiator for independent software vendors (ISVs) and enterprises alike by 2018."*
>
> **David Cearley**
> Vice President and Gartner Fellow.

User Experience Design at emids

Healthcare requires an empathetic and collaborative approach to solving problems!

At emids we think employing a **'design thinking'** and an **'iterative design'** methodology is essential to build successful healthcare software and solutions. This approach coupled with our strong healthcare industry exposure enables accurate requirement articulation keeping the relevant personas of clinicians, patients, etc., and their needs in mind, which ultimately translate into the creation of desired healthcare experiences.

Our Service Offerings:

User Experience Assessments | User Research | Interaction Design
Data Visualization | Visual Design | User Interface Development

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