Neonatal period represents first 28 days of life, which is the most vulnerable time for a child's survival especially for the preterm babies. High neonatal mortality is a prominent and persistent problem across the globe. Non-availability of trained staff and infrastructure are the major recognized hurdles in the quality care of these neonates. Hourly progress growth charts and reports are still maintained manually by nurses along with continuous calculation of drug dosage and nutrition as per the changing weight of the baby. iNICU (integrated Neonatology Intensive Care Unit) leverages Beaglebone and Intel Edison based IoT integration with biomedical devices in NICU i.e. monitor, ventilator and blood gas machine. iNICU is hosted on IBM Softlayer based cloud computing infrastructure and map NICU workflow in Java based responsive web application to provide translational research informatics support to the clinicians. iNICU captures real time vital parameters i.e. respiration rate, heart rate, lab data and PACS amounting for millions of data points per day per child. Stream of data is sent to Apache Kafka layer which stores the same in Apache Cassandra NoSQL. iNICU also captures clinical data like feed intake, urine output, and daily assessment of child in PostgreSQL database. It acts as first Big Data hub (of both structured and unstructured data) of neonates across India offering temporal (longitudinal) data of their stay in NICU and allow clinicians in evaluating efficacy of their interventions. iNICU leverages drools based clinical rule based engine and deep learning based big data analytical model coded in R and PMML. iNICU solution aims to improve care time, fills skill gap, enable remote monitoring of neonates in rural regions, assists in identifying the early onset of disease, and reduction in neonatal mortality.