I think: M should be algebraic. 」

Birational isomorphism represents an important intermediate notion of equivalence among varieties. Birational varieties are alike in more ways than they differ; to the classical geometers they were different manifestations of the same variety. This point of view is immediately clear to an algebraist, in whose terms the local rings of functions around points $p \in M$, $q \in N$ on two varieties M and N are isomorphic as local rings $\Leftrightarrow$ there is a birational map $f: M \longrightarrow N$ taking p to q and biregular around p. It will take us somewhat longer to appreciate the close relationship between birational manifolds.

「 Forget it!. Maybe, sometime, refer to P24 ~ P26 Hartshorne. 」

To start, note the following:

Let $f: M \longrightarrow N$ be a rational map, defined and holomorphic on the complement $M-V$ of a subvariety V of codimension ≥ 2. If φ is any global holomorphic p-form on N, then by Hartogs' theorem the pullback $f^*\varphi$ on $M-V$ extends uniquely to a p-form on all of M; thus we have a map