These are:

1) <u>homologically invariant</u>, that is,

$M_i \to \overline{M}_i$, $C_i \to \overline{C}_i$ compatible

homology isom $\Longrightarrow$

$T_1 \square_{C_1} \cdots \square_{C_{n-1}} T_n \longrightarrow \overline{T}_1 \square_{\overline{C}_1} \cdots \square_{\overline{C}_{n-1}} \overline{T}_n$

is a homology isom.

Corollary: $\mathrm{Cotor}^{C_1, \dots, C_{n-1}}(M_1, \dots, M_n)$ is a well defined functor.

2) <u>balanced</u>, e.g. $n=3$, $i=2$:

$T_1 \square_{C_1} M_2 \square_{C_2} T_3 \longrightarrow T_1 \square_{C_1} T_2 \square_{C_2} T_3$

is homology isom.

<u>Eilenberg</u> - <u>Moore</u> <u>theorem</u> <u>on</u> <u>chain</u> <u>models</u>:

let $X_1 \to A_1$, $X_2 \to A_1 \times A_2, \dots, X_n \to A_{n-1}$ be fibrations with $A_1, \dots, A_{n-1}$ = 1-reduced simplicial sets. Then

$E = X_1 \times_{A_1} X_2 \times_{A_2} \cdots \times_{A_{n-1}} X_n \longrightarrow T_1 \square_{A_1} T_2 \square_{A_2} \cdots \square_{A_{n-1}} T_n$ is a homology isom

where: T_i = construction and $X_i \to T_i$ is homology isom.