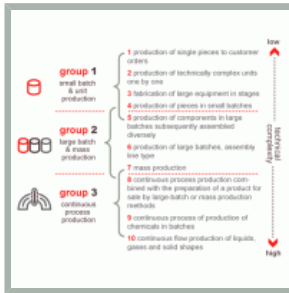


technology typology



characteristics

author:	Woodward, Joan
country:	United Kingdom
period:	1958
type:	model
role:	consultant and manager
activity:	analyse and reflect
topic:	org. design & development and technology & operations
abstr. level:	environment
perspective:	living
status:	final
module:	classics I
comments:	0

description:

The British academic, Joan Woodward, conducted an extensive, comparative empirical study from 1950 to 1959 at the South East Essex College of Technology and the Imperial College of Science and Technology in the United Kingdom. The study focused on the relationship between organisational structure and organisational performance. It measured a firm's comparative performance relative to its industry peers and compared this indicator to its structural dimensions such as span of control, number of management levels, management style, etc.

The research team was amazed when the 100 surveys from manufacturing organisations in the South Essex region indicated no direct statistically significant relationship between the type of structure and the level of performance.

A relationship between structure and performance surfaced only by introducing an extra variable: the type of technology. Woodward's study, thereby, rebuked the accepted notion that 'one best way' of organising existed by linking the variations found in organisational structures with differences in manufacturing technology. Her data showed that function and form were complementary in commercially successful firms.

Woodward classified technology as follows:

Group 1. SMALL BATCH and UNIT TECHNOLOGY

all technologies that produce one or several products simultaneously such as art work and construction projects. Successful companies with unit technologies reflect organic structures.

Group 2. LARGE BATCH and MASS PRODUCTION

technologies in assembly line operations, such as automobile and consumer electronics plants that produce standardized, identical products based on routines and standard procedures. Successful companies with mass technologies reflect mechanistic structures.

Group 3. CONTINUOUS PROCESS PRODUCTION

technologies at ongoing, non-discreet, capital intensive production processes that require minimal manual involvement such as chemical plants and oil refineries. Successful companies in this category reflect organic structures and more levels of management.

Woodward described the technical complexity of a manufacturing process as the degree of its mechanisation -- unit technology as the least complex and the continuous process production as the most. She discovered that the relationship between technical complexity and the level of work routine was shaped as an inverse U. Unit and continuous process technologies required non-routine behaviour while mass production was better served by mechanical structures characterised by routines and procedures. Managers of commercially successful companies were the most aware of their firms' technological characteristics.

assets:



woodward technology typology

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pros:

- Joan Woodward's study challenged classical management's belief in the existence of universal principles -- one set of golden management rules to create effective organisations. Her study led to the contingency approach that assumes that the most effective organisational structure depends on external conditions.
- The study showed the usefulness of the comparative method in detecting relationships among organisational characteristics rather than studying a single case.
- The model provides a framework to analyse manufacturing organisations and to detect similarities and differences using unit, batch, mass and flow production as a shared language.

cons:

- Although the contingency theory provided useful insights, the analysis lacked refinement. Most organisations now operate in what contingency theorists call a dynamic environment that requires an organic organisation.
- Contingency theory adopted technological determinism as a key assumption that negated the possibility of using one technology in multiple ways.
- Contingency theory assumed that one factor could change while the other variables remained constant. In practise, this objective proved impossible.
- Organisations often use multiple technologies at different levels. Woodward's typology failed to describe the organisation in its full diversity. Her study focused primarily on small organisations. The identified relationships are less clear for larger organisations.

- The typology applies only to manufacturing organisations and not to service providers or other non-production organisations.
- The typology was dated. In 1987, F.M Hull and P.D. Collins added technical unit processing as a fourth category. This category referred to batch processes that create custom-made products of a high level of knowledge/technical complexity such as aircraft and satellite production.

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