

THE SIGNIFICANCE OF SOCIAL CONTEXT UPON DESIGN

Experiences in Developing Communities in Rural Africa and Aboriginal Australia

Mark. F. Moran

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Abstract: *The paper is based upon the experience of the Author from tertiary engineering education, to a consulting engineering practice in Sydney, to rural development projects in Africa, and most recently to infrastructural development in Aboriginal communities throughout Australia. In drawing upon the most formative elements of this experience, the author demonstrates the necessity of tailoring design and technology into the appropriate social context.*

The limitations of Contemporary Practice

The evolution of knowledge in modern western technology is rooted to western society. Western technology over the last two hundred years has developed within the matrix of western scientific rationality and in the context of developing western society. Contemporary engineering and technology practice is largely locked into what is appropriate to the mainstream norm of modern western society.

In addition to this social bias, secondary and tertiary education in technology and engineering in Australia is largely restricted to the scientific and economic values which drive conventional western practice. Engineers and technologists are not educated to question the social bias of their technology or to consider social context as a design imperative.

This is exacerbated by the professional specialisation which has accompanied the explosion of technical knowledge this century. This specialisation has led to the reduction and compartmentalisation of design and has further removed the designer from the bigger picture and the human dimension to the problem.

The combination of these effects has resulted in diminished perception of holistic systems and a general failure in designers to consider the full range of relevant design imperatives and especially a failure to consider the appropriateness of the outcome to the social context in which they are operating.

Nowhere is this shortcoming highlighted more so than the application of western design methodology into culturally differentiated communities.

International Development: A Case Study in Rural Water Supply in Lesotho, Africa

Lesotho is the independent nation of the Basotho people. It is a small country of predominantly mountainous terrain and is entirely land locked within South Africa.

The construction of rural water supply systems in Lesotho is coordinated by the Village Water Supply Section (VWSS) of the Ministry of Interior. The design process adopted by the VWSS was developed through a system analysis of technology within the social context of

rural Lesotho. Although not perfect, this process is a demonstrative case study of the notion of development and self determination.

There is a district office of VWSS in each of the ten government districts of Lesotho. Project initiation began with the approach by village representatives to a district office. The district office responded with advice on what the village must do in preparation to be considered for assistance. This included the election of a "Village Water Committee" and nominal contributions into a future maintenance fund.

When the district office was satisfied that a water supply project would be consistent with the needs of the village and that a genuine level of commitment existed with the people of the village, the project proceeded into design. Design was undertaken largely in accordance with standard details. Design parameters included; ease of labour intensive construction, appropriateness for village level operation and maintenance, maximum usage of local materials (eg stone water tanks), and cost efficiency.

Construction was undertaken by village provided labour. VWSS would station several trained technicians to supervise the work, organise the village workers, undertake specialist tasks, and train "waterminders" for future maintenance. The village water committee was responsible for the domestic matters involved with the organisation of labour, including dispute resolution. Foreign aid funding covered the procurement of all materials and the wages of the technical staff. Government of Lesotho funds covered all administrative and institutional costs. The village contributed with free labour and the provision of food and accommodation for the VWSS technical workers.

The onus of responsibility for the operation and maintenance of the completed project was with the village. Costs involved were borne by the community and paid from the collective maintenance fund. Maintenance tasks were undertaken by the trained waterminder with technical backup by the VWSS if required. The institutional support of government expenditure in maintenance was thereby minimised.

Social factors within each village were the most crucial determinate to a successful project. A successful project, both during construction and in long term maintenance, was attributable to enthusiastic participation during construction, a well trained and organised village water committee, and ownership and acceptance of maintenance responsibility at the end. This response was in turn related to need, acceptance, participation and ownership.

A related experience of VWSS was that frequently the most isolated and logistically complicated mountain villages were often the most successful projects. This was related to the greater level of social unity and enthusiasm that often exists in remote disadvantaged communities.

Through tailoring technology and financial assistance, the VWSS was able to assist a village with its collective goal of obtaining an improved water supply. Through personal contribution and participation, the process fostered ownership by the villagers and contributed to empowerment and self-determination.

There were of course many problems along the way, but the case study demonstrates a developmental approach to design and technological interventions.

Infrastructure Development and Self-Determination in Aboriginal Australia

This discussion does not intend to draw any cultural comparisons between Aboriginal and African culture. There are indeed very few. At a holistic level, Africa or any undeveloped country has the advantage of the simplicity of a comparatively homogeneous social context. Aboriginal Australia, as for most indigenous peoples, is a social context within a larger western social context.

There are substantial complexities which exist as result of this context of Aboriginal society within the larger context of Non-Aboriginal Australia, The driving forces which define the interplay between these two social contexts can be expressed as *welfare* and *status*.

Australia is a welfare state. It is the responsibility of the Australian Government to ensure the equitable welfare of all Australian people in such matters as social security, health, education, housing and infrastructure. This notion of equitable welfare is generally translated by government and most non-Aboriginal Australians as equity in the standard of service and technology provision.

The response of Aboriginal people is frequently related to their perceived status within the broader Australian society. Aboriginal people see an improvement in this status through the obtainment of national standards of technology, enabling closer integration into national lifestyles.

The resulting outcome of this equitable provision of welfare by the Australian government and the status based response of Aboriginal people, is generally the standardisation of technology across two very different social contexts. There are many examples in Australia of complex technologies in remote aboriginal communities which have been designed to provide such equitable level of service. This technology is often provided in communities without the technical skill or economic resources sufficient for operation and maintenance.

The above discussion does not suggest that equity for all Australians should not be a goal of technology interventions. Indeed an equal quality of life should be the desired outcome. But this outcome cannot be assumed through application of the same technology consistent with the mainstream. Rather, an equal outcome is achieved through a different process and technology which is appropriate to the particular social context of the beneficiary Aboriginal group.

There are many more elements to this complex equation. Bruce Walker (1990) identified several parameters which he argued as being fundamental to the understanding of service provision in Aboriginal communities.

It is not consistent with the theme of this paper to dwell into the complexities surrounding service provision to Aboriginal Australia. Rather the desired corollary is that Aboriginal Australia, in its own right, is a different social context to broader Australia. It follows that design should be undertaken in this particular social context to serve and develop Aboriginal Australia. The translation of technology from one social context to another is not appropriate and is often the cause of increased dependency on government support and the erosion of self management and sustainable development in Aboriginal communities.

Through appropriate design to the social context of Aboriginal Australia, it is considered that the process may approach the previously described case study of development and empowerment.

A Checklist of Social Considerations during Design

Specific social considerations that should be included in design for socially differentiated communities are given below:

- . Initial definition of the problem in human terms. What specifically is the need of the people involved and how do they see technology as being the solution to that need? Involvement of the beneficiaries and commitment to the project not only leads to a more appropriate design, but also fosters greater community ownership of the technology.
- . Holistic interpretation of the community functions facilitated by the proposed intervention. How does the particular intervention fit into and modify the broad system of the community?
- . How appropriate is the technology to the particular social context? Is it consistent with the general level of technacy throughout the community? Is a technological intervention really the best solution? Should the intervention be accompanied with training or user education? There are little opportunities for ownership or understanding when the intervention is essentially foreign to the community.
- . Does the community have the recurrent economic finances to operate and maintain the technology? How available is specialist servicing and spare parts? Will the technology be maintained by members of the community or increase the dependency on outside support?
- . What opportunities are there for employment, both during construction and subsequent operation? This not only improves the skills base and financial opportunities for those employed, but also fosters ownership of the project.
- . Assessment of the absorptive capacity of the various institutions both within the community and outside that are responsible for service provision and funding. An appropriate design and delivery process may cut across the normal operation of these institutions.

Some Opportunities for Improvement

- . Most importantly, the education curriculum of engineers and technologists should include elements of the general social implications of technology. Decisions made in the process of design are often limited to the scientific and economic values which drive conventional western practice. Education should impart a general perspective of the holistic nature of settlement social systems and how technology fits into and modifies this system. It may not be realistic to undertake detailed education into social and cultural systems, which are highly diversified. Such education may also lead to generalisations and assumptions being made to the values and needs of the target population. Rather, education should focus on the way to go about determining the pertinent social factors which relate to the proposed technology. This process should include the input of community consultation and knowledgeable intermediaries as appropriate.
- . Ethics and guidelines of professional institutions should allow for the special social considerations that apply to socially differentiated communities. Rule one of the Code

of Ethics of the Institution of Engineers Australia states that the responsibility of engineers for the welfare, health and safety of the community shall at all times come before their responsibility to the profession, to sectional or private interests, or to other engineers. It is therefore ironic that the Institution has no technical guidelines for engineering practice in socially or culturally differentiated communities such as Aboriginal communities. By disregarding the social bias of their training and technology, engineers (usually in good faith), are often guilty of contravening this most fundamental professional ethic.

- . There is need for more technical generalists who are working outside their specialist professions who can work across social and cultural systems. Such generalists have an important role to play in education and as intermediaries during the design process. As there are few educational opportunities for such generalists to pursue, their expertise is largely experience based.
- . Service providers and government funding agencies have a greater role in ensuring that an appropriate design process is followed, especially through funding guidelines. An example of this could be the mandatory presence of an independent technologist in an intermediary capacity during consultation between the community and the government or consultant designer. Also consultation and design checklists could be formulated for completion by the designer during the design process.
- . Australian Standards should strive for equity of outcomes (quality of life) which can not be assumed to flow from equal inputs of technology. This does not imply a lower or higher standard to a either social context, but rather an appropriate standard to each as necessary. Standards which can only be met through inappropriate and unsustainable technology must require further examination.

Conclusion

There is a tendency for technology and design to become an end in itself. Technology should be a tool for people to use to improve their quality of life. All too often technologists instead go looking for the problem. The machine is designed to serve man, not man the machine.

A most graphic model of the limitations of technology can be seen in outback Australia. In remote Aboriginal outstations, sophisticated water treatment and telecommunication technology has contributed spectacularly to the reduction of hardships caused by both remoteness and harsh climate. It has also contributed towards equity with national lifestyles. Such technology however, requires maintenance skills and recurrent budgets which are beyond the resources of such remote places. Technology in this respect has thereby further increased dependency on outside government support and has contributed to the erosion of self determination and sustainable development in aboriginal communities.

Although the shortcomings of such a process are most evident in culturally differentiated communities where social differences are highlighted, there are social implications to any technological intervention. There are many examples of engineering works or various technologies that have had an adverse social impact upon the same society that the designers have originated from within.

The process that is leading to these inadequate outcomes is being driven by a perception of design and technology in isolation to its social context. This view is frequently evident in government agencies, service providers and often the beneficiaries themselves.

Engineers and technologists are often the only professionals involved in this process and in their learned capacity it is particularly their responsibility to assess the social context and implications of their design, and present broader designs and arguments accordingly.

References

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