THE INFLUENCE OF CULTURAL FACTORS IN THE IMPLEMENTATION OF PRODUCT-SERVICE SYSTEMS

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Abstract

Product Service Systems (PSS) is a business strategy for decoupling economic growth from resource and energy consumption, manufacturing volume, and waste generation. PSS encourages a radical change of behavior for both producers and consumers by decreasing material flows. A shift towards material volume reduction implies the modification of cultural patterns and values, which are deeply rooted in society. Therefore, special attention should be paid to cultural factors that may motive such a change of behavior towards dematerialization.

This paper discusses the influence of cultural factors in the implementation of product/service systems. The research is based on the fact that the cultural dimensions may play a decisive role for the success of the Product-Service System strategy. To implement PSS, it is important first to understand certain cultural patterns that might encourage people to prefer a service-orientated economy (PSS) instead of physical ownership.

For this study, we propose a cultural comparison of countries where PSS have been implemented in order to co-relate certain behavior and cultural patterns concerning PSS. To proceed, we used the model of Cultural Dimensions proposed by Geert Hofstede in order to discover possible drivers and obstacles in the acceptance of the PSS model.

Keywords: Cultural Dimensions: Product Service Systems; Sustainable Product Design.

1. Introduction

The transition towards sustainability seems to be slow, difficult, and controversial in the present industrial economy. Industrial progress and economic growth are directly linked to the use of materials and energy inputs to the production of goods. For instance, in developing countries industrial development fosters economic growth; it also provides a hope of pulling millions of people out of abject poverty. However, the making, using, and disposing of increasing numbers of mass-produced artifacts may bring about several constraints. For instance, the exponential increment in the use of natural resources and energy consumption, the saturation of markets, and the potential degradation of the natural and social environments may burden sustainable development. However, in an economy based on the production and consumption of physical products it is hard to envision a better way of living while producing and consuming less [1]. This can be summarized with the following trends related to resource consumption in the world [2]:

- The household consumption worldwide increased 68% between 1980 and 1998. In many developing countries, food purchases account for as much as 70% of family income.

- The world energy production rose 42% between 1980 and 2000 and will grow 150-230% by 2050. Renewable resources like solar and wind account for only 11.5% of current consumption.

- Over the past century, world water withdrawals increased almost as fast as population growth. Currently, 70% of freshwater withdrawals are for agriculture.

- In developed countries, the working age population will shrink from 740 million to 690 million between 2000 and 2025. In developing countries, it will increase from 3 billion to 4 billion people.

Unless we reconsider the present industrial economy model, environmental and economic constraints will severely impede economic growth. Therefore, the search for a new and more sustainable approach is imperative for both developed and developing industries. It implies reducing the consumption of natural resources and decreasing the volume of mass-production. Such a 'dematerialization' approach may bring environmental and social constraints into balance with the industrial economy, thus, generating a more qualitative satisfaction of human needs rather than a quantitative sufficiency of goods [3], i.e. rather than focusing on material possessions each person's well-being would be focused on.

As a result, products should provide the highest possible utilization value (profitability) for the longest period of time (durability) while consuming as few material resources and as little energy as possible (eco-efficiency). This represents a challenge for product design. It implies the extension of the design focus beyond the traditional methods of mass-production, as well as the review of the tools and methodologies that are currently being used in the design process. I.e., to shift production toward dematerialization, products should be enhanced with added values to compensate volume reduction. Added values come largely from product lifecycle improvement and service contents implementation [4].

Life cycle improvement is the accumulation and application of know-how to enhance the environmental performance of a product from *cradle to cradle* [5]. It includes strategies such as Design for the Environment (DfE) and Life Cycle Assessment (LCA), which are currently under development and implementation. On the other hand, service contents implementation is the enrichment or replacement of material artifacts with services. For example, instead of buying a physical product, the consumer gets a combination of product and services that fulfill her demands. This approach is known as Product and Service Systems (PSS).

This paper discusses the influence of cultural factors in the implementation of Product-Service systems. The research is based on the fact that the cultural dimensions, which have not yet been considered in PSS development [6], may play a decisive role in the success of the Product-Service System strategy. To implement PSS, we must first try to understand certain cultural patterns that might encourage people, groups and nations to prefer a service-oriented economy (PSS) instead of physical products ownership. For this study, we propose a cultural comparison of countries where PSS has been (to some extent) successful, along with countries where PSS implementation is in a very early stage or presents some 'cultural resistance'. We co-relate certain behavior patterns present in different cultures concerning PSS, with the model of Cultural Dimensions proposed by Geert Hofstede in order to discover possible drivers and obstacles in the acceptance of the PSS model.

2. From products to services

PSS is a new design strategy aimed at the dematerialization of the economy. This approach has the potential of decoupling economic growth from resource and energy consumption,

manufacturing volume, and waste generation [7]. PSS promotes a shift from designing and selling physical products only, to selling a system of products accompanied with services, which jointly fulfill the user's demands [8]. For example, if a user wants mow the lawn, (s)he may have three possibilities: (1) To buy a *Traditional Product*, which is the physical result of an industrial process, (2) to rent a *Use Oriented Service*, which is an integrated system of product and services, or (3) to acquire a *Result Oriented Service* from a company that takes care of the lawn. Figure 1 shows the main differences between buying a traditional product and acquiring a PSS.

1. Traditional Product	2. Use Oriented Service	3. Result Oriented Service
Consumer **buys** a power-riding mower to mow the lawn.	Consumer **rents** a power-riding mower to mow the lawn.	Consumer **buys a service** from a company that takes care of the lawn.
Client owns, uses and stores the power-riding mower. S(he) is also responsible for the lawn.	Company owns and maintains the power-riding mower. Client is in charge of the lawn.	Company owns, maintains and stores the gardening equipment and is responsible for the lawn.
Initial investment for consumer could be considerable.	Consumer costs are spread over time (s)he pays each time s(he) uses the equipment).	Consumer costs are spread over time (they pay each time the service is provided).
Consumer ultimately disposes of power-riding mower and buys replacement.	Company is responsible for disposal and has incentives to prolong, re-use and recycle the equipment.	Company is responsible for disposal and has incentives to prolong, re-use and recycle the equipment.

Figure1. Differences between traditional products and Product-Service Systems. (Adapted from Unep, 2002)

2.1 Types of product service systems

Implementation of PSS must be progressive, from physical artifacts to services. It implies a gradual introduction of service contents into material flows. As a result, different types of service systems are introduced according to the intended level of dematerialization. For the present study we adapted the categorization of PSS proposed by the European Network on Sustainable Product-Service Development (SusProNet) [9]:

1. Traditional Products**:** means that the user owns the product. Under this category products can be enriched with service contents, thus products become Product Oriented Services. Examples of product with added value are:

    a) *Service Integration*, a new service is added to an existing product

    b) *Service Extension*, the value of a product is increased through an additional service, e.g. Upgrading, Repair, and Guarantees.

    c) *Vertical Integration*, e.g. production on demand, and made to order services.

2. Use Oriented Service: The service provider owns the product and sells functions instead of artifacts, e.g. sharing, pooling, and leasing.

3. Result oriented Service: the physical product is 'replaced' by a service and becomes a Product Substituting Service. Examples are: facility management, and contracting.

The core of Product-Service Systems lies in the replacement of physical products with services. As a result, artifacts become only means to deliver services through service-centered activities. For example, video-conferencing can replace physical transportation. In this way, PSS may offer an alternative to the *'business as usual'* mindset of the present industrial

economy. However, PSS implementation presupposes a radical change of behavior for both producers and consumers. For instance, firms are supposed to decrease the production of material goods in a radical way, while maintaining lucrative business. On the other hand, consumers are driven towards a change of consumption patterns. Instead of buying a product, consumers satisfy their needs through acquiring product-services.

The shift towards material volume reduction implies the alteration of cultural patterns and values, which are deeply rooted in the different socio-cultural groups. For example, in Japanese packaging culture, where over wrapping is considered a symbol of politeness and respect to others, a change towards dematerialization seems contradictory from a cultural perspective. Therefore, special attention should be paid to the social and cultural values that may motivate such a change in behavior. We argue that cultural factors play an important role in determining for instance, the user's needs, the relationship between producers and consumers, the creation of business opportunities, and the establishment of the social needs for the local economy.

3. Dimensions of culture.

The world is full of confrontations between people, groups, and nations who think, feel, and act in different ways. At the same time these people, groups, and nations are exposed to common problems, which demand cooperation for their solution. For instance, coping with environmental problems demands cooperation of everybody. According to Hofstede, a scholar specialized in culture and organizations, understanding the differences in the way people think, feel, and act is imperative for bringing about effective global solutions.

Culture is the common term we use to define and differentiate the members of one group from another. Cultural differences manifest themselves in several ways. They can be described in terms of symbols, heroes, rituals, and values [10] that are acquired from the social environment in which people grow up. As stated by Hofstede, culture is a collective phenomenon presented among groups and categories of people that can be defined for example, at the national level, ethnic and/or religious level, gender level, or corporate level. In terms of culture. Others argue that the members of any group face common problems [11] that can be defined in terms of the relation to authority (power distance), the relationship between the individual and the group (collectivism Vs. individualism), gender issues (femininity Vs. masculinity), control of aggression and expression of emotions (uncertainty avoidance), and long-term and short-term orientation. These areas represent Hofstede's five dimensions of culture. They are the aspects of a culture that can be measured in a relative way to other cultures.

The five dimensions were identified and compared in a quantitative research conducted at IBM worldwide. In the survey it was possible to classify 53 countries, according to a statistical analysis of the answers of the IBM employees from different nations. In the study, answers on questions about the values of similar employees from different countries revealed common problems, but with solutions differing from country to country.

We argue that by incorporating Hofstede's model into the PSS discussion, we may get some insights of the way people from different cultures respond to a Product-Service System according to their cultural backgrounds. For instance, when implementing a car-pooling service in an *individualist* country, (according to the five dimension model) it should have very particular features that fulfill the user's demands of that specific group. On the contrary, the same car-pooling service must present some different characteristics if it is addressed to a *collective* country.

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According to the research on PSS, drivers and obstacles have been frequently encountered at different levels -governmental, corporative, marketing, and social- during the PSS implementation [12]. If we correlate this with the Five Dimensions model, we may get some insights and ideas for further development. Thus, from the cultural perspective, we may assume that what appears to be a driving force for one society, may be explained as a barrier for a culturally opposite one. For this study, we considered Germany, Sweden, The Netherlands, and Italy as countries where PSS exists in a large number, along with Japan and Brazil as examples of countries where the number of PSS is very low. Table 1 shows the scores for the countries selected in the present study, according to Hofstede's Five Dimensions model.

Table 1. Hofstede's five dimensions values for the six countries selected.

Countries / Dimensions	Germany	Italy	Holland	Japan	Sweden	Brazil
Power Distance	35	50	38	54	31	69
Individualism/Collectivism	67	76	80	46	71	38
Masculinity / Femininity	66	70	14	95	5	49
Uncertainty Avoidance	65	75	53	92	29	76
Long-Term Orientation	31	----	44	80	33	69

3.1 Power distance in PSS development.

The power distance (PD) refers to the extent less powerful members expect and accept unequal power distribution within a culture. PD informs us about dependence relationships in a country. For instance, in small power distance countries there is limited dependence of subordinates and bosses, and preference for consultation. The main differences of large and small power distance cultures are summarized in table 2.

In the study, Brazil scores high on PD and Sweden among the lowest, while Japan and Italy have middle scores, and both Holland and Germany relatively low scores. For PSS implementation one of the main ideas is that the differences on Power Distance may have an influence in the decision-making process at the national and corporate level. In countries with small PD index, corporate initiatives towards PSS do not necessarily depend on government regulations and policies. For instance in Sweden, deregulation and globalization are drivers towards an increasing number of new players in the market [13] On the contrary, in countries with large PD index, the role of the central government is expected as a driving force for PSS development. In this case, barriers emerge when administrative, regulative and legislative organizations do not communicate with each other and there is a slow decision processes.

Table 2. Differences between large power distance cultures and small power distance cultures.

Large Power Distance Cultures	Small Power Distance Cultures
Centralization is common	Decentralization is common
The way to change the system is by changing people at the top	The way to change the system is by changing the rules (evolution)
Focus on the role of managers	Focus on the role of employees

At the corporate level, countries with low power distance might prefer a participative management style of the business. Small power distance cultures have a tendency towards

horizontal power distribution inside an organization, and the role of employees is very important.

Therefore, introducing the PSS idea to all levels of a company might bring about a more collaboration in the creation of new business opportunities focused on service contents intensification. In contrast, in large power distance societies, knowledge is expected from managers and leaders. It implies the training of top and middle rank personnel. In this case, training on PSS strategies must focus on top down decision-making style. This is demonstrated in the case of Italian companies (Italy has a middle PD index), where the lack of expert knowledge is considered an obstacle for PSS implementation within a firm.

3.2 Individualism versus collectivism

The contrast between individualism and collectivism (IC) can be defined as "people looking after themselves and their immediate family only, versus people belonging to groups within a group that look after them in exchange for loyalty." For instance, in collective cultures priority is given to the relationship between people. In the analysis of cultural dimensions, The Netherlands scores very high in IC index. Italy, Sweden and Germany also score high, Japan scores medium and Brazil relatively low. In table 3 the differences between collectivist cultures and individualist cultures are summarized.

For PSS implementation, we consider this dimension as one of the most significant, since one of the challenges of PSS is changing private/personal product ownership i.e., PSS was developed as an alternative to individual consumption of goods. However, individual consumption still remains constant even in some PSS cases. An example of this is the supporting platforms of PSS such as, mobile phones or the Internet, which at the present time are mainly proposed for individual use. Paradoxically, PSS has been promoted in societies with high individualist index, such as Holland, Sweden, and Italy, and it is within this dimension that PSS barriers are more frequent. Examples of obstacles found in PSS are:

a. Product sharing, without the appropriate protections or contractual provisions, could make the individual user less concerned about maintenance and potentially increase environmental burdens.

b. The user should have a clear idea about the benefit of the service.

c. High costs of staff training; sales and benefits are not measured.

d. A small company that implements a service has difficulties to cooperate with big external partners.

e. A network of companies that supply services needs to be managed, but co-operation partners do not trust each other.

f. The stigma attached to collective service provision would inhibit attempts to develop community facilities.

g. Co-production with customers: a lot of services are 'produced' in close co-operation with the client. As a result, innovations might require the involvement of a wide range of actors, which makes it time-consuming and more complex to make decisions concerning the service innovation.

It becomes clear how these obstacles emphasize the *individuality* of the four European countries included in the study. For example, in case (a) we can see how individual user satisfaction in a sharing service is essential. Further, if we consider IC and masculinity index (see next section) together, success and individuality become even more evident. This is the

case of Italy, which scores high in both IC and masculinity indexes. Cases (b), (e) and (f), are another clear example that evidences individualism and masculinity as barriers for PSS. Usually, cooperation with partners suggests *collective organization* and *warm relations* within the group. These are characteristics of feminine-collective cultures.

Table 3. Differences between collectivist cultures and individualist cultures

Collective Cultures	Individualist Cultures
Identity is based in the social network to which one belongs	Identity is based in the individual
Relationship employer-employee is perceived in moral terms, like a family link	Relationship employer-employee is a contract supposed to be based on mutual advance
The decision making process takes employees' into account	Decision making is based only on the skills and rules of employees
Management of groups	Management of individuals
Relationship prevails over task	Task prevails over relationship
Collective interest over individual interest	Individual interest over collective interest
Dominant role of the state in the economic system	Restrained role of the state in the economic system

On the other hand, in the case of collective countries such as Japan and Brazil, their collective orientation may be a strong driving factor for PSS, specially in the development of User Oriented Services. For instance, pooling, renting, and sharing services could be widely accepted within the community, given the tendency toward large Power Distance presented in these countries. We argue that scenario building for collective interaction must be further proposed and studied. It may give us ideas of the user's behaviors and patterns of consumption when using User Oriented Services. For example, a comparative study of pooling service in an individual and a collective society may suggest different ways of a sharing a product, as well as the level of acceptance of the service in each culture.

3.3 Masculinity versus femininity

Masculinity and Femininity (MAS) refer to the roles of men and women in a society, not their physical characteristics. In general it can be said that the MAS dimension is related to consumers and their perception of the value created by products and PSS [14]. For instance, in masculine cultures such us Japan, Germany and Italy, people are concerned with the physical character of a product. The use of a product has a meaning that is above and beyond the functionality it provides, e.g. an automobile supplies more than mobility; it confers social status and identity. On the other hand, in a feminine culture like Sweden, and The Netherlands, people pay more attention to the functional characteristics of a product, e.g. safety, and maintenance in the case of the automobile. The main characteristics of masculine and feminine roles are exposed in Table 4. According to the study, Japan is the highest in MAS. Germany and Italy also score high, Brazil is in the middle and Sweden and The Netherlands are the lowest.

Based on their cultural characteristics, feminine versus masculine countries excel in different types of industries. According to Hofstede, feminine countries such as the Netherlands and Sweden have a relative advantage in service industries like consulting and transport, while masculine countries such as Japan or Germany have a competitive advantage in mass-produced manufacturing.

Table 4. Masculine and feminine roles.

Masculine Cultures	Feminine cultures
Material success and progress	Carrying for others, preservation
Money and material possession are important	People and Warm relationships
Performance	Welfare
Economic growth	Preservation of the environment
Managers decisive and assertive	Managers use intuition

Additionally, in the Netherlands, a feminine oriented culture, PSS development is highly concerned with strategies to increase the customer awareness of environmental issues e.g. recycling and re-use of a product. Also, concerns with the compatibility of the service with ethics, values and strategies may be important factors too [15]. In opposition to that, masculine oriented cultures such as Japan or Germany are more concerned with the success of PSS in terms of market penetration. For instance, in Germany companies entering a new market feel more open to PSS implementation. They believe that no competitor may offer the same service, and they are prepared to compete in a fiercer market with innovative resources, such as information and communication technologies.

3.4 Uncertainty avoidance

Uncertainty avoidance (UA) is "the extent to which people feel threatened by uncertainty and ambiguity and try to avoid these situations." For instance, in cultures of strong uncertainty avoidance, there is a need for rules and formality to structure life. This translates into the search of truth and belief in experts. This dimension is particularly important for PSS, because UA is related to resistance towards change. It must be said however, that resistance is a factor present in almost all cultures, except for the case of Sweden, which scores below 30 in Hofstede's study. Cultures with strong UA feel the need to structure reality. If combined with individualism, the rules are explicit and written, as in the case of Germans. Combined with collectivism, the rules are implicit and rooted in tradition, like in Japan. Differences between weak and strong uncertainty avoidance cultures are summarized in table 5. In the study, Japan scored very high, followed by Brazil and Italy. The Netherlands and Germany also score low, and Sweden among the lowest.

Table 5. Differences between weak and strong uncertainty avoidance

Weak Uncertainty Avoidance	Strong Uncertainty Avoidance
Comfortable in ambiguous situations and with unfamiliar risks	Acceptance of familiar risks, fear of ambiguous situations and of unfamiliar risks
What is different is curious	What is different is dangerous
There should not be more rules than strictly necessary	Emotional need for rules, even if these will never work
Tolerance, moderation	Conservatism, extremism, law and order
Belief in generalist and common sense	Belief in experts and specialization

The obstacles encountered in PSS for consumers are referred mainly to the understanding of a service and the perception of the added value. For companies it is related to the willingness to switch from products to service-systems. Correlations with power distance and long-term orientation must be established to corroborate signs of change in the business strategy. Some of the obstacles encountered in PSS related to UA are:

a. It is difficult to protect services against copying, due to its intangible nature.

b. Absence of R&D departments in small and medium enterprises.

c. Many PSS are based on ITC. It changes the nature of work and demands technical skills. This requires additional education, changes in behavior and alters the organization of work.

d. Skeptical and conservative customers do not trust the new system.

e. Companies are afraid that long tradition markets may not accept the PSS-model.

Cultures with strong UA are skeptic towards new challenges. Therefore, in this cultures rules are needed beforehand for the understanding of the service concept, such as in the case of Italy and Japan. Similarly, strong UA combined with Individualism suggests that groups tend to remain under the same *business as usual* mindset and cannot visualize the potential of PSS. On the other hand strong UA combined with large power distance, as in the case of Brazil, requires strong policy and regulation as a driving force for PSS acceptance. Finally, a culture with high UA combined with collectivism, as in Japan; the cooperation between the central government and the industrial sector is advisable.

4. Conclusion

The main objective of the PSS strategy is the radical reduction of material goods. It implies a change in the current industrial practices of production and consumption. To shift toward dematerialization, and to compensate volume reduction, products should be enhanced with added values, which come largely from product life cycle know-how and service contents implementation. The latter implies the enrichment or replacement of material artifacts with services. Yet, consuming services instead of physical products implies the modification of certain cultural behaviors that are acquired from the social environment in which people grow up. We argue that the *unlearning* of these cultural values is, in most cases, difficult or even impossible.

Consequently, for the implementation of PSS in cross-cultural contexts, cultural differences must be taken into consideration. This is where the dimensions of a culture come into play. In this study, the correlation of these dimensions exposed common and contrasting problems that are directly related to the acceptance of PSS in a specific culture. For example, the detection of obstacles and drivers puts in evidence the cultural particularity of a country. Therefore, when implementing PSS, if we know these cultural attributes, it is possible to predict possible drivers and obstacles before hand. As a result, a more appropriate design of the business strategy can be envisioned.

On the other hand, although PSS *may* help to reduce the environmental constraints; the intensification of services does not always *guarantee* less environmental impact. Consequently, we argue that cross-cultural scenarios for further PSS study must be implemented. Scenario building may facilitate the design of tools to assess the eco-effectiveness of the PSS approach. For industrial design, this implies the development of new methodologies that involve users from different cultural backgrounds into the design process. These methodologies must focus on the usability of the service on a cultural basis. i.e., the interaction of costumers with the use-oriented services and the result-oriented services proposed by PSS must be correlated to cultural dimensions.

5. References

[1]   Manzini E., "Strategic Design for Sustainability: Towards a New Mix of Products and Services", <u>Proceedings of the first International Symposium on Environmentally Conscious Design and Inverse Manufacturing (EcoDesign)</u>, Tokyo, 1999, pp 434-437.

[2]   Doering D.S et all, "<u>Tomorrow Markets, Global Trends and their Implications for Business</u>". World Resource Institute, 2003.

[3]   Tomiyama, T., "The Post Mass Production Paradigm", <u>Proceedings of the first International Symposium on Environmentally Conscious Design and Inverse Manufacturing (EcoDesign)</u>, Tokyo, 1999, pp 162-167.

[4]   Tomiyama, T., "Service Engineering to Intensify Service Contents in Product Life Cycles", <u>Proceedings of the Second International Symposium on Environmentally Conscious Design and Inverse Manufacturing (EcoDesign)</u>, Tokyo, 2001.

[5]   McDonough W. and Braungart M., "<u>Cradle to Cladle: Remaking the Way We Make Things</u>", North Print Press, 2002 .

[6]   Tischner U. And Verkuijl M., "<u>Suspronet Report: First Draft Report of PSS Review</u>", December, 2002.

[7]   Stahel W., "From Product to Services: Selling Performance Instead of Goods" <u>Proceedings of the first International Symposium on Environmentally Conscious Design and Inverse Manufacturing (EcoDesign)</u>, Tokyo, 1999.

[8]   Manzini E. and Vezzoli C., "<u>Product-Service Systems and Sustainability: Opportunities for Sustainable Solutions</u>", Unep, 2002.

[9]   Tischner, U, Schmincke, E, Rubik, F.: <u>How To Do Ecodesign? A Guide for Environmentally and Economically Sound Design</u>, Germany, 2000.

[10]   Hofstede G., "<u>Cultures and Organizations: Software of the Mind</u>", McGlaw-Hill, 1997.

[11]   Inkeles, A. and Levinson D., "<u>National Character: The Study of Modal Personality and Sociocultural Systems</u>", Addison-Wesley, 1969.

[12]   Tischner U. Brezet H.and Grablowitz A., "Sustainable Services and Systems (3S): Sustainability in Practice?" <u>Positioning paper presented at PREPARE Thematic Group on Sustainable Services and System</u>, August, 2001.

[13]   Mont, O., "Reaching Sustainable Consumption through the Concept of a Product-service System (PSS)", <u>Proceeding of TemaNord.</u> Copenhagen, 2001.

[14]   Mooij M<u>., "Global Marketing and Advertising, Understanding Cultural Paradoxes"</u>, Sage Publications, London, 1998.

[15]   Goedkoop, M.J et all, "<u>Product Service systems, Ecological and Economic Basics</u>". Vrom, EZ. The Hague, 1999.

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