

I. Introduction

The Jusman House is a large single-family house located near the city of Solo (Surakarta) in Central Java, Indonesia. It was designed and built by its owner, Mr. Jusman Siswandi (called 'Jusman'), an anthropologist by training, in collaboration with the master craftsman, Wardoyo.

The house is located amidst rice fields on the outskirts of the city and is primarily built in a traditional Indonesian fashion. It features a series of pavilions which are spatially linked in an imaginative and animated way. The house successfully adapts for contemporary needs the traditional Indonesian architectural vocabulary, safeguarding the integrity of time-honoured construction techniques while integrating modern design sensibilities. Furthermore, it demonstrates how sensitive interventions can be made in otherwise rural landscapes; not only does it employ a traditional low-rise building style but it also suggests an incremental pattern of growth whereby the house might be expanded in response to future requirements.

II. Contextual Information

a. Historical background

Jusman conceived the idea of building a house in Solo (where he has an office and workshop for textiles and handicrafts) in 1992. He wanted a spacious house and also to feel part of the country landscape, and so he chose a plot on the outskirts of the city. The house was built over a period of four years. It was designed, supervised and built by Jusman together with a master craftsman who was employed in his business.

Jusman is clear that the house is an experiment – an exercise in extending the traditional vocabulary of Indonesian building while bringing to it contemporary ideas about a house. Moreover, for him the challenge lay in how to intervene in the landscape without destroying the rural context. In addition, he was keen to provide some semi-private spaces which would encourage interaction with the neighbouring villages.

b. Site, topography and climate

The site is just west of the city limits of Solo (which has a population of 600,000), and is very close to the airport. While access from the airport is extremely easy, to drive into the centre of the city takes approximately half an hour. This area on the outskirts of Solo is still rural: the landscape mainly comprises paddy fields with some clusters of village houses. The project can be seen as part of a widespread trend: over the past few decades, all over Asia, well-off urban dwellers have bought land on the outskirts of cities in order to build themselves spacious family houses. Usually these are referred to as farmhouses, as they are set in agricultural landscape and many owners acquire adjoining farms in order to safeguard development in the vicinity of their homes.

The access road to the Jusman residence is narrow; some parts are tarred and others are still dirt track. The house is set in an essentially rural landscape with minimal urban infrastructure. The plot adjoining the site to the north is also owned by Jusman Siswandi. He has encouraged villagers to play soccer there in the evenings – not only making contact socially but also ensuring that the plot is perceived as a facility for the local villagers and not just a speculative investment made by the owner. Elsewhere are paddy fields, with some coconut groves. The village adjoining the site is called Gajahah, meaning ‘the place of elephants’. (Historically the village and its surrounding area were used by the royal family to stable their elephants.)

The site and the surrounding area are essentially flat; some areas are below road level. The land is mainly used for paddy cultivation. The city of Solo is 150 metres above sea level.

The region is characterized by a very hot and humid climate, with temperatures averaging 30°C throughout the year. It enjoys rain nearly all year round; out of the monsoon season afternoon showers (typical of tropical areas) are common. During the monsoon season, from November to February, rain can occur at any time.

c. Local architectural character

The architecture of central Java typically comprises wood-frame buildings with brick infill walls, clay-tiled roofs and generous overhangs. A traditional feature is the use of a range of semi-covered elements such as verandas, pavilions and porticoes; these facilitate transition between the interior and exterior spaces while also acting as ‘buffer zones’ to shield the building’s inner spaces from the sun and rain. This system of spaces encourages flexible patterns of use for different times of day and seasons of the year.

In the tropics, as in many other regions of the world, the focus of traditional buildings is to provide a comfortable habitation with minimal means and without reliance on mechanical controls. Thus the traditional architecture of the region puts a premium on the movement of air within the building and the maximizing of external surface area (which is kept well protected by shade), often by fragmenting the building into a series of pavilions.

III. Programme

a. Conditions of programme formulation

Jusman Siswandi decided to build a spacious house for himself and his family, who hitherto occupied rather cramped quarters – shared with the extended family – in the capital, Jakarta. As he already had a business office in Solo, Jusman had reason to visit the city often. He therefore chose to build a house that he could use frequently on his business trips and perhaps later in life move to permanently. At present Jusman still lives in Jakarta, mainly on account of his children’s education; but he hopes that once they reach college age he will be able to make Solo his base. It was with these intentions that he embarked upon the project to build the house.

b. *Objectives*

As well as providing himself with a comfortable home, Jusman's objective was to create spaces within the house that would serve as an amenity for his rural neighbours and thus facilitate social interaction. Besides creating very fluid transitions at the entrance, and easy access into the house, Jusman was also extremely sensitive to the scale of the house and the visual impact it would have on the landscape. He took great pains to make it compatible with the other dwellings in the region as well as keep it low-rise in character so that it would not dominate the landscape.

c. *Functional requirements*

Jusman designed the project himself; an accomplished draughtsman, he was able to draw up the plans to communicate his vision to the master craftsman with whom he collaborated. He decided to break down the complex into five major components: the main house, comprising two *pendopos* (halls or gathering spaces) as well as the other usual functional spaces; a service area; a separate prayer room (*musalla*); a gazebo overlooking a pond; and a water tower. At the rear of the house an area has been sectioned off to create a warehouse. Within the house the different functional spaces have their own distinct identities, and the spaces between them are animated in interesting ways.

IV. Description

a. *Project data*

The house is located in a plot of 3,060 square metres with a total floor area of 900 square metres. The house itself is divided into many distinct functional units, such as the two *pendopo* halls and the main house with an upper floor. In addition there is a service area which contains a kitchen, veranda and toilet for the use of domestic staff. In one corner of the site is the prayer room; opposite it, across the large pond, is the gazebo. At the rear of the site, a wall separates the house from a warehousing area used for the artefacts and handicrafts in which Jusman deals. The water tower is a prominent element on the site; this contains the water tank as well as other services such as the generator.

Specific floor areas are as follows:

Plot size: 3,061 square metres

Built areas:

Pendopo (halls 1 and 2): 350 square metres

Main house (ground and first floor): 299 square metres

Service area: 60 square metres

Prayer room: 21 square metres

Gazebo, warehouse, tower: 167.50 square metres

Total floor area: 897.50 square metres

b. *Evolution of design concepts*

The design concept involved organizing the site according to the principles of traditional Indonesian architecture, via the creation of a series of interconnected pavilions. In the way they are positioned on the site, these pavilions create a distinct hierarchy of privacy. On entering the plot, the first space that one encounters is a *pendopo*, an open hall that is enjoyed as a public amenity by villagers, neighbours and household staff. Displayed in the *pendopo* is Jusman's collection of traditional Indonesian musical instruments (*gamelan*), which the villagers and neighbours play. It is not uncommon to be entertained for the entire evening by teenagers from surrounding villages, who come to use the space for their own entertainment. This space, therefore, while very much part of the house and within the private realm of the plot, is public in its use and nature. Moreover, the way the paving leads up to the house from the exterior street almost acts as an invitation for the passer-by to enter.

This *pendopo* hall is followed by a second *pendopo*, which acts as an entrance hall and reception area for the main house. Here guests who are not well known to the family can be received, thus preventing unfamiliar visitors from entering the private areas of the house. Again, this is a free-standing pavilion; it accommodates a guest toilet and a guest room, which is treated as a separate unit.

Moving on further within the plot one arrives at the main house. This structure, with a ground and an upper floor, contains the main living spaces for the family: living room, dining room, kitchen, ground-floor bedroom and, on the upper level, master bedroom with small study. This opens out onto a veranda overlooking a large pond, which occupies the depth of the plot. On one side of the pond sits the gazebo, which is used as an entertainment pavilion, and on the other is the prayer room. Against the compound wall is a water tank and also the service areas, which contain a room for the domestic staff, together with a toilet, a kitchen and a veranda. At one end of the plot, cordoned off by the compound wall, is a 'C'-shaped warehouse arranged around a courtyard.

The house consists of several individual components, which are arranged to create an interesting composition of massing. The use of structures of various sizes visually implies a cluster of spaces rather than a single house. The spaces between the pavilions are connected and enlivened by the use of water areas, gardens and varied textures of paving. Together they combine to create a range of experiences as one moves through the house and across the site.

The layout gives a sense of incremental growth: each of these pavilions, being independent, could be built at different times as required by the family. Indeed, the design suggests that the house is still undergoing a process of evolution and development. The organization of the pavilions, while contributing to a coherent composition, is loose enough to suggest that additions and expansions might be made at a later date to different parts of the house.

The series of outdoor 'rooms' – the gazebo, the space below the water tanks, the *pendopo*, the terrace, the verandas overlooking the pond, etc. – evokes the different spatial configurations that occur in traditional Indonesian architecture. Moreover, the transition

between exterior and interior is extremely easy: every 'room' enjoys views of patios, gardens, courtyards or the extended landscape, all framed by the house itself. Thus the interior is always visually engaged with the exterior – sometimes acting as a counterpoint to it, and sometimes as an extension.

The fragmentation of the building into a number of separate units has helped to create a cluster-like visual landscape, especially in terms of the roofscape. This is a highly appropriate response to the larger landscape within which the house is situated. The scale that is thus established visually connects the house with the rural architecture around it; it does not imply that the compound contains a large mansion but rather suggests a collection of smaller dwellings which have been organized together in one compound.

c. *Structure, Materials, Technology*

The building employs many different construction systems. The entrance *pendopo* and the reception room that follows it are both built using a wooden structure, employing nail-free joinery details together with proportions and structural systems drawn from the local vernacular. All the rituals associated with traditional building in this area – involving the sanctifying of the site as well as the process of building – were adhered to in the construction of the first two pavilions, which of all the project's elements allude most literally to traditional forms. For example, in the local community the placement of the ridge on the roof is an important moment in the construction process, and is celebrated with a feast. The laying of foundations is another cause for celebration. The engagement with rituals such as this, together with the form of the structures themselves, roots these pavilions to the site – even suggesting to the observer that they may predate the other structures.

The first *pendopo* is built using a traditional wooden frame on stone foundations. Both the supporting structure and the roof are built in wood. The second *pendopo*, however, uses load-bearing walls for the supporting structure, and has a wood-frame roof.

The main house, water tower, prayer room and service areas are constructed using a timber roof and a standard reinforced cement concrete (RCC) skeleton. The infill walls, however, are made from specially fired brick tiles and bricks of varying shapes, sizes and textures. The walls completely disguise the main RCC frame, and their distinctive patina is one of the most visually striking aspects of the house. The construction thus mixes traditional elements with contemporary techniques.

The finishing materials employed in the house comprise exposed timber roof structures, wooden infill panels, exposed bricks and plaster. Terracotta tiles are used for the roof, and terrazzo and clay tiles for the floor. On the ground floor, clay tiles salvaged from a demolished Chinese house have been used in combination with terrazzo panels. Similarly, the wood used for the structure was recycled from demolished houses in the vicinity. Of the wood used in the house, only 20 per cent is new.

The wall finishes comprise pigmented plaster in the upper parts of the house and handmade brick in the lower parts. The plaster is a mixture of white and grey cement with colouring

agents. While this finish creates painterly surfaces it is also economical, eliminating the need for additional paint on the wall surfaces. The clay bricks used at ground level are of varying sizes, and were made using a traditional method involving paddy straw and paddy skin.

The technology employed in the building is extremely varied, spanning the entire spectrum from indigenous and traditional methods to contemporary RCC construction. Similarly, the house employs a wide range of finishes from extremely low-cost, traditional ones, such as clay tiles and hand-pressed and baked brick infill panels, to exquisite wood carvings for the screens and very contemporary designs for the doorknobs, handles, handrails, lampshades, etc. (all designed by Jusman especially for the house). This play between traditional and modern design creates a sophisticated architectural vocabulary which, while rooted in traditional Indonesian architecture, connects very effectively with contemporary life.

The house has its own bore well, which supplies an overhead water tank. A septic tank and soak pits take care of sewage (there are no city services since the house is located outside the city limits). The house has been well designed to take advantage of natural ventilation and passive cooling. No other innovative techniques have been used in either cooling or heating the house.

d. Origin of technology, materials and labour force

As with the choice of materials and construction techniques, a wide array of craftsmen was employed in the job, ranging from the traditional master builder who supervised all the work, to local craftsmen who still practise indigenous crafts. Skilled labour was employed for most of the main construction work, such as the RCC slabs and columns.

The house was designed entirely by its owner, Jusman Siswandi, with some consultation with architect friends with regard to the structure. No professionals were formally involved in the design. (As the building is situated outside the city limits there were no such requirements by the local authority.)

Jusman worked in close collaboration with Wardoyo, a master craftsman who had been an employee of his business for many years. Wardoyo employed skilled and unskilled labour from the surrounding villages and from Solo, and put together a construction team for the building. Wardoyo conceived all the details and the proportions of the structural members, while Jusman conceived the overall plan, the choice of finishes, the landscape planting and other design features in the house.

As the house was built in different stages, and different parts employed different technologies, the labour force varied depending on the part of the house under construction. The master craftsman consulted from time to time with local engineers to check calculations for reinforcement and foundation widths. No other consultants were employed in the house: the design, construction, services, interiors and commissioning of the building were all carried out by the owner and his collaborating master craftsman.

V. Construction Schedule and Costs

a. Project history

Jusman Siswandi began developing his idea to build a house in late 1992. Work on the design began in August 1993, after procuring the site. Construction began in March 1994, following a few months of trial line-outs to adjust the design. In 1996 a bedroom on the ground floor of the main house was ready and during the next two years the owner lived in this space to supervise the construction and completion of the remaining work. The house as it stands today was completed by 1998.

b. Total costs and source of finance

The cost of the house approximates to USD 300 per square metre, with a total project cost of around USD 266,500 excluding land (the cost of which was approximately USD 31,000). Due to the massive fluctuation in local currency values over the past decade, however, the real value of such conversions is difficult to determine. The project was financed totally by the owner. As his business involves exports, the currency fluctuations did not affect him adversely as he was earning consistently in US dollars.

c. Maintenance costs

Jusman Siswandi and his family continue to use the house on a regular basis – staying there for at least two weeks per month – and have, over the years, established a trusted and well-trained staff to maintain and service the compound. The maintenance costs on a monthly basis are difficult to ascertain, but it is clear that the cost of maintenance is low on account of the design and materials used. In spite of the fact that the house is not permanently used, it is in a very good condition, with virtually no signs of adverse weathering.

VI. Technical Assessment

a. Functional assessment

Due to the fragmented nature of its plan, where different functions are organized in different units, the house is able to expand or contract depending on the number of people using it. If the extended family is visiting, for example, the various pavilions may be filled with different activities; whereas when the owner and his wife are alone in the house, they can restrict themselves to the main unit without having to open up the other spaces. When the owners organize large social events, the entire compound is filled.

The main house, which is the space most heavily used by the owners, is compact, efficient and self-contained. It thus meets the owners' requirement of providing a comfortable living space (in contrast to their Jakarta apartment) while also offering access to all necessary amenities.

In addition, the house acts as a kind of 'canvas' for the owner and his wife – who are keen textile and handicraft collectors as well as entrepreneurs – to display their collection, thus integrating their interest with their living space.

An outstanding feature of the house from the functional point of view is the entrance *pendopo*. This space works extremely well in the way it engages the villagers to participate in making music on traditional instruments. It is also a truly social space, used by the villagers to chat, share tea and interact among themselves – often encouraged by the domestic staff employed at the house, who are from the surrounding villages.

b. *Climatic performance*

As the house is organized as a series of pavilions, air moves through it very easily – a prerequisite for keeping the space cool in a tropical climate. From a climatic point of view, therefore, the house functions well, with generous roof overhangs keeping the rain out while allowing the breeze to move through it. The roof is well insulated. At various times of the day – early in the morning, mid- and late afternoon, late evening and night – the house is a comfortable place to be.

c. *Choice of materials, level of technology*

The building employs a range of technologies and materials, the choice of which was based on locally available skills. The chief materials are wood (for the structure and floors), clay (for the floors and roof tiles) and bricks (for wall cladding). Great care was taken not only to employ traditional techniques and skills but also to source them economically.

The wood was largely recycled from older houses in the region which had been recently demolished. From the time he decided to build his house, Jusman began sourcing and salvaging wood from historical buildings. Thus, approximately 80 per cent of the wood used in the house is recycled. Indeed, in the design of the two timber-structured *pendopos* many of the decisions regarding the spans, sizes and configuration of the spaces were based on the sizes of the wood available. Similarly, the clay tiles used for the flooring were salvaged from an old Chinese house that was demolished nearby. These recycled materials have been seamlessly integrated within the overall design of the house, and it is extremely difficult to differentiate the old from the new.

The bricks that clad the walls add an important dimension to the design, creating rich textures that are highly attractive. The bricks were made with clay from the site and, as mentioned above, by employing traditional methods: paddy husk and paddy skin were used for both reinforcing the bricks and firing them. They are innovative, however, in their varied sizing, which was realized jointly by the owner and a traditional bricklayer, Sri Mulyono.

d. *Ageing and maintenance*

Since its completion the building has weathered extremely well. This can be attributed to the articulation of the roof, which has kept the building free of water. The building materials

(which are mostly natural, such as clay, tiles and bricks) have also weathered well, slowly attaining a patina of age. The widespread use of exposed terracotta creates varying effects at different times. During the day the terracotta cuts off reflectivity and glare, and the light that suffuses the rooms is very subdued and cool. (A generous use of water areas within and outside the building adds to this sense of coolness.) At night the terracotta creates a subdued patina, and with soft artificial light it evokes a sense of age.

During the day the house looks fresh, and it is easy to establish its true age. At night, however, it takes on an antiquated look. A wonderful quality of the house, therefore, is that the visitor is forced to continually question the date of its different parts. In fact, to the casual observer it might well appear that additions have been made to an existing set of structures.

e. *Design features*

The interiors are visually stunning and contain a host of both contemporary and antique artefacts. The owner and his wife have taken great care to display their collection to best effect, and have also involved themselves with the design of fittings and furnishings – from doorknobs to exquisitely hand-carved chairs. The careful design of the interior contributes to the sense of continuity and integration between the built architectural form and the all-over ambience of the house.

From the design point of view, the only element in the house that is not well integrated – and which betrays the fact that its designer is not a trained architect – is the staircase to the upper level. While the stair is exquisitely finished, its positioning in relation to the space is uncomfortable. Also, it breaks an otherwise stunning vista through the house to the pond at the rear.

VII. Users

a. *Those who benefit from the project*

The users of the house are essentially Jusman Siswandi's family, with one component of the house (the entrance *pendopo*) also being used by the local villagers. The villagers use the *pendopo* extremely easily, and readily engage with the musical instruments which are intended as a facility for the community. The pavilions and the platforms built into the *pendopo* make for easy seating, creating a very relaxed environment. Also, the transparency of the entrance to the *pendopo* makes it a truly public space set within a private compound.

The main house is used by the family and their live-in domestic staff. The house seems to function well and to meet the needs of the owners and their family. As stated earlier, in contrast to the family's small apartment in Jakarta, this house affords plenty of space and has also become an expression of the design sensibilities and interests of the owners.

b. Response to project by local community

As discussed above, the house has been very sensitively inserted within the landscape and is built of traditional local materials. As a result it harmonizes well with the nearby villages and is not seen as ostentatious or discordant with the surroundings. As a trained anthropologist, Siswandi is acutely aware of the social and cultural dynamics of the area. He was particularly concerned that all rituals connected with traditional building practices – sanctifying the foundation, celebrating the placement of the ridge, etc. – should be carried out down to the last detail.

VIII. Persons Involved

Wardoyo, the master craftsman, has been employed for twenty-four years in Jusman Siswandi's family business, where he supervises the fabrication of furniture and handicrafts. (Wardoyo is his familiar name; his registered name is Wardagung.) Wardoyo has no formal training in construction other than at high-school level. He is approximately fifty-two years old and gained his experience working for a master craftsman in Solo before joining the business.

Wardoyo's role in the construction of the house was that of project manager, responsible for solving and evolving construction details, designing the foundations and detailing the roof structure as well as sourcing material, craftsmen and labour, and scheduling the construction programme. While he had a vivid idea about the structure and form of the building, and could interpret Siswandi's sketches, he was pleasantly surprised when he experienced the spatial quality of the final building, especially in terms of the textures, materials and quality of light.

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