

BIM Revolution

for

Japanese House Maker

BIM&IDDS International Seminar

2013/11/01

Sekisui House Inc.

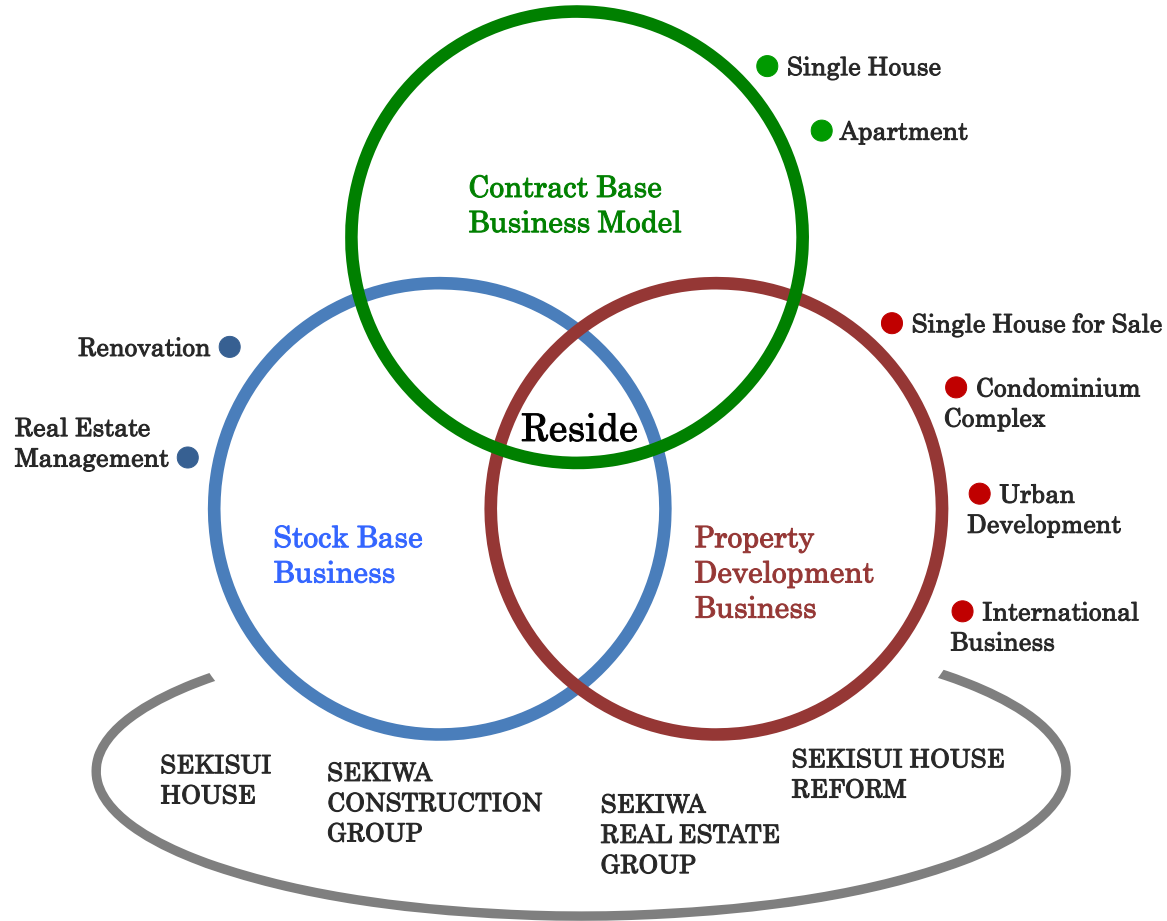
Amemiya • Fujioka

□Sekisui House Ltd. Summary

Company	Sekisui House Ltd.
Established	1960/8/1
Capital	186.5 Billion Yen (As of 2013/1)
Revenue	1.815 Trillion Yen (2013 Est.)
Sales Profit	130.0 Billion Yen (2013 Est.)
Net Profit	77.0 Billion Yen (2013 Est.)
Accumulated Unit Built	2.159 Million Units (As of 2013 Q2)

Employees	15,346 (As of 2013/4)
	• Sales 4,300, Design 1,600, Construction 1,200
	• Factory 1,200, Maintenance 1,400
Factory	Tohoku, Kanto, Shizuoka, Hyogo, Yamaguchi
R&D	R&D Institute (Kyoto)
Sales	Branches & Sales Offices 125
	Customer Centers 30
	Model Houses 431

Organizational Structure for SLOW & SMART



Sekisui House Group Overview

Single housing business (contracting, design and construction of Single houses)



Rental housing business



Condominium development business



Sekisui House Group Overview

Urban development business



Fukuoka Island City (18ha)



Rokko Island City (131ha)

Overseas business



Australia



USA



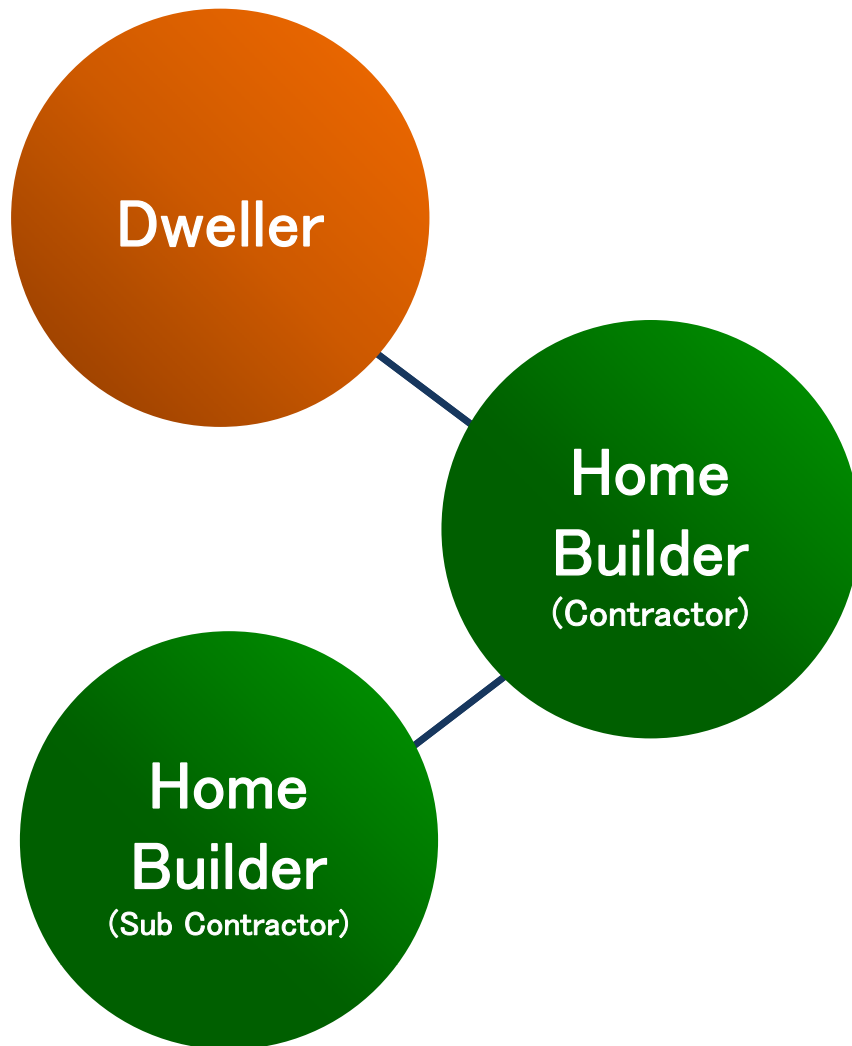
Singapore



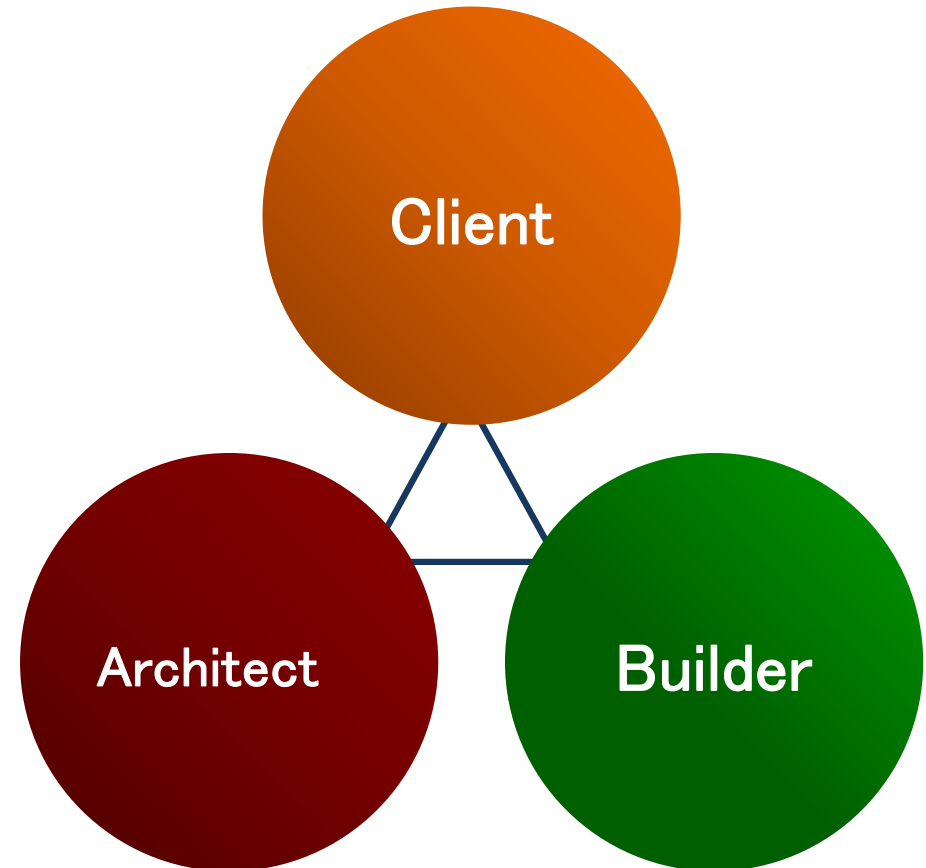
China

House Maker is not Home Builder ! ?

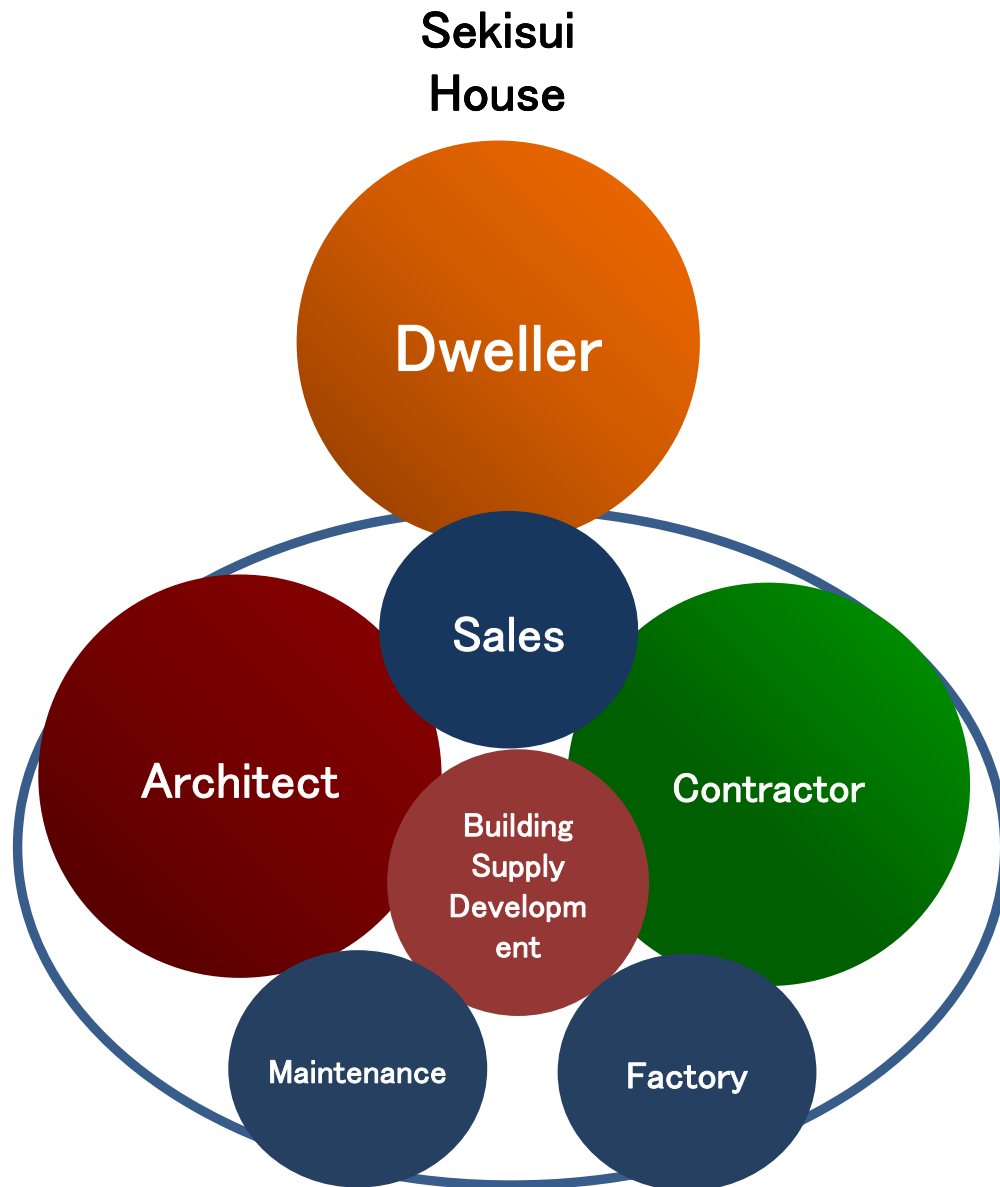
Home Builder



Architect + Builder (Contractor)



General Concept of House Maker



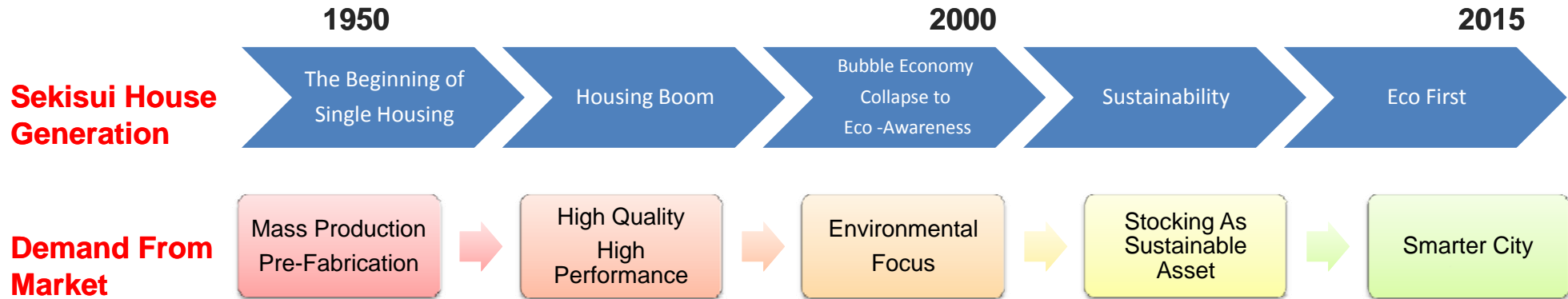
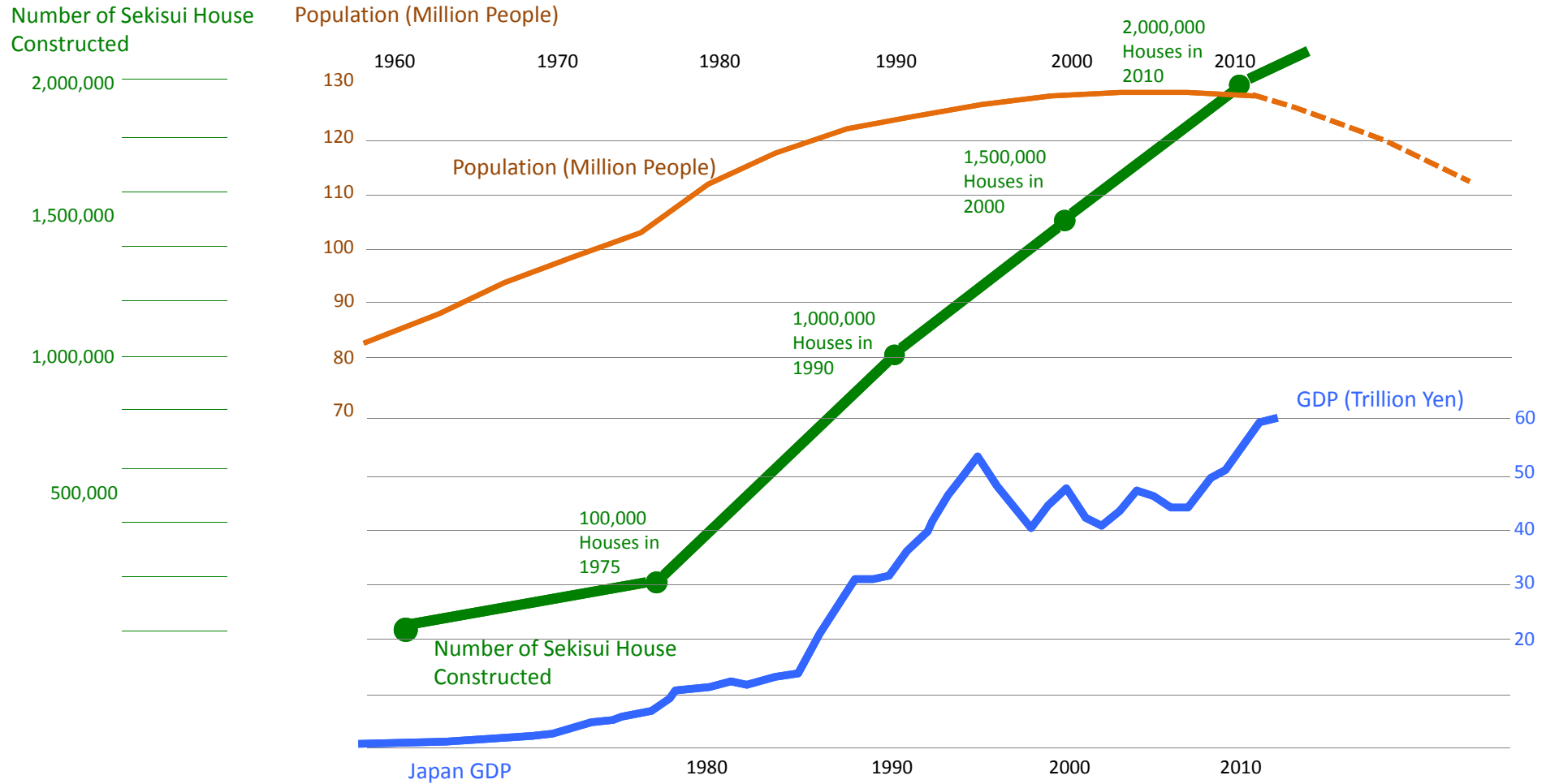
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- Architects 1,600
- Construction 1,200
- Factory 1,200
- Maintenance 1,400

Factories: Tohoku, Kanto, Shizuoka, Hyogo, Yamaguchi

R&D: R&D Institute (Kyoto)

Sekisui House Approach “During and After” High Growth Economy



Custom CAD System Merging into BIM Approach

Sekisui House Custom CAD System meets BIM

CAD System @ Sekisui History

1972 AUDESEI – I (Mini Comp.)
1979 AUDESEI – III (Host Comp.)
1993 AUDESEI – III (EWS)
1998 SIDECS (PC)
SIDECS - Presentation
CG 3S (CG System)

BIM RESEARCH
2008

General CAD System History

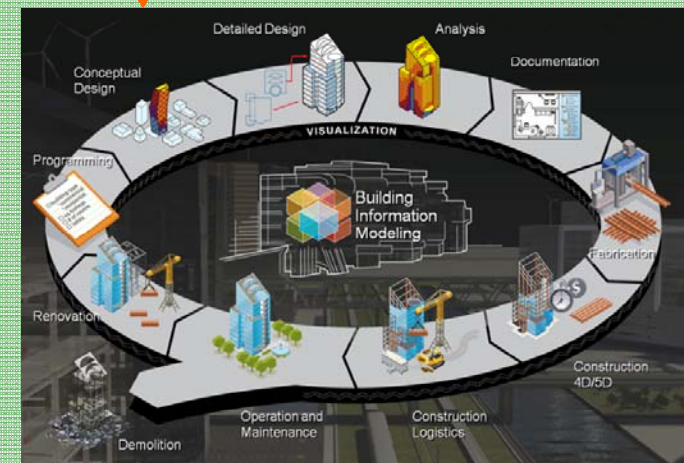
2D CAD
3D CAD / 3D CG
Object Oriented CAD
Feature Based Modeling
Parametric Modeling

BIM

2010
New SIDECS



BIM Revolution



(BIM vision)

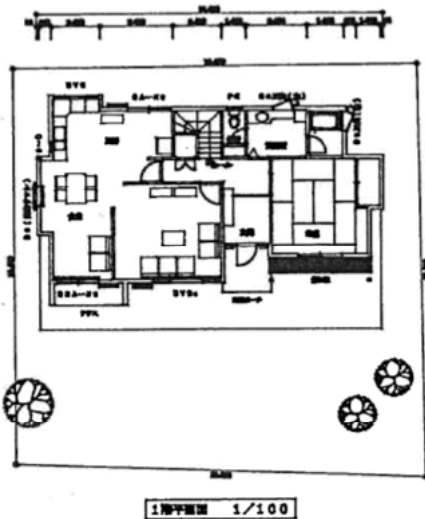
Sekisui House First 3D CAD System : AUDESEI - III

Sekisui CAD System
AUDESEI

Automatic Drafting
And
Estimation System

House Model was able to produce dimensional drawings, perspective images, and Cost Estimation Document in 20 minutes after the design is fixed.

- Plan 1/50, 1/100
- Elevation 1/100
- Exterior Perspectives from 8 directions
- Foundation
- Spec Sheets & Finish Schedules
- Cost Estimation Document



Automatic Drafting and Estimation System in Sekisui

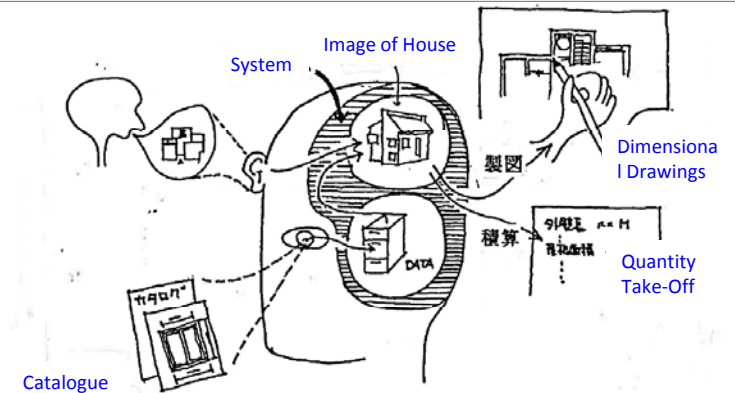
AUDESEI in 1972 : Automatic Drafting & Estimation System

3D CAD System : Automated Production Process of

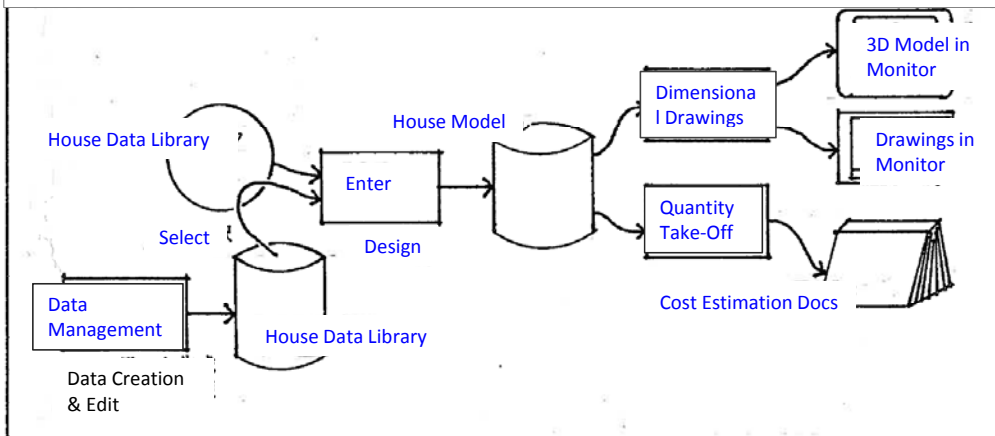
- Dimensional Drawing
- Perspectives
- Cost Estimation

Increased Production Rate of Sales Activities and Customer Satisfaction

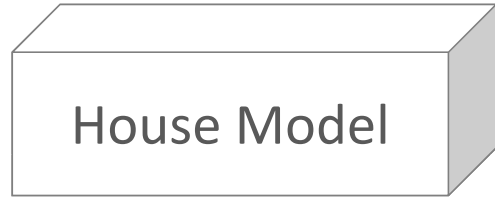
Design Concept & Design Development



System Concept



SEKISUI HOUSE CAD System: SIDECS vs. BIM Software



Revit

ArchiCAD

SIDECS
(Digid)

タイプ プロパティ

ファミリー(F): 窓-Fix-半外付 ロード(L)...

タイプ(T): w1700 h0750 複製(D)...

名前変更(R)...

タイプパラメータ:

パラメータ	値
建設	
壁の納まり	ホスト別
建築タイプ	
マテリアルと仕上げ	
額縁	木 - ナチュラル
サッシ	金属 - アルミ
ガラス	ガラス - 透明
寸法	
高さ	750.0
幅	1700.0
粗幅	
ラフ高	
識別情報	
キーノート	08520 II
タイプの説明	AW
アセンブリコード	
モデル	
製造元	
URL	
説明	
アセンブリの説明	
タイプマーク	130
面格	
IFCパラメータ	

<< プレビュー(P) OK キャンセル 適用

選択したオブジェクトの設定

他のオブジェクトをロード...

フォルダビュー

DAIKAN
-> 01-0000
-> 01-ZERO
-> 01-Some
-> 01-TOEX
-> 01-01 窓の部品
-> 01-02 窓の部品
-> 01-03 窓の部品
-> 01-04 窓の部品
-> 01-05 窓の部品
-> 01-06 窓の部品
-> 01-07 窓の部品
-> 01-08 窓の部品
-> 01-09 窓の部品
-> 01-10 窓の部品
-> 01-11 窓の部品
-> 01-12 窓の部品
-> 01-13 窓の部品
-> 01-14 窓の部品
-> 01-15 窓の部品
-> 01-16 窓の部品
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-> 01-91 窓の部品
-> 01-92 窓の部品
-> 01-93 窓の部品
-> 01-94 窓の部品
-> 01-95 窓の部品
-> 01-96 窓の部品
-> 01-97 窓の部品
-> 01-98 窓の部品
-> 01-99 窓の部品
-> 01-100 窓の部品

パラメータ

名前: 窓-Fix-半外付
高さ: 750.0
幅: 1700.0
粗幅: 1700.0
ラフ高: 1700.0

シンボル

オブジェクト線種を有効:
オブジェクト中心を有効:
シンボル線: 実線
シンボル線幅: 0.10 mm

モジュール

一般: オブジェクトの材質を使用

材質レイヤー作成: 作成済:

OK キャンセル

部材のプロパティ

FCDP-SW2型ins-C(242C)0.75
逆断ペア
額縁

属性名	属性値
色	
出荷区分_1	工場出荷
特注部材注記	データ調整
入隅チェック	あり
取り付け高さ	0
図形ずれ初	0
高さタイプ	標準
レベル変更	一般
ガラス種類	逆断ペア

属性名	属性値
窓タイプ	C(242C)
巾タイプ	750
格子の有無	なし
隅区分コード	普通

1回戻り

平面

3次元

注記情報

注記指示 詳細 適用

詳細

属性名	システム属性名	属性値
部材名		C00101
総称		FCDP断熱スイング...
名称_1		FCDP-SW2型ins-C...
名称_2		FCDP-SW2型ins
名称_4		アルミサッシ
設計表示色		1
色		
窓タイプ	型決定エイリ...	C(242C)
型決定エイリアス		750
格子の有無	型決定エイリ...	なし
型決定エイリアス		普通
集計区分名_1		サッシ
投影図補用表示...		1
出荷区分_1		工場出荷
特注部材注記		データ調整
入力時表示対象イ...		4
入力時大分類コ...		2
巾タイプ		750
雨戸タイプ		C(242C)
面格子タイプ		C(242C)0.75
窓手摺りタイプ		0.75
内降子タイプ		C(242C)0.75
壁厚区分		B
壁厚正面		126
壁厚背面		70.5
注記制御文字式1		FCDP-SW2型ins-C...
隅区分コード		普通
入隅チェックコード		あり
模様展開方法_3		2
取り付け高さ		1008
取り付け高さ変更量		0
長さ		1000
外厚		126
壁内厚		70.5
採光長さ		490
採光高さ		1004
図形ずれ初期値		0

SIDECS Detail Design Mode

The screenshot displays the SIDECS software interface in 'Detail Design Mode'. The central focus is a 3D model of a house, overlaid with a grid and the text 'SIDECS (Software) House Information Model'. The interface includes a menu bar at the top with options like 'ファイル(F)', '編集(E)', '表示(V)', '補助(T)', '操作(O)', '注記・寸法(M)', 'ウインドウ(W)', '立面(O)', '構造(K)', '敷地(S)', 'DXF取込操作(G)', '詳細表現(D)', 'その他(A)', 'ヘルプ(H)', 'テスト1', 'テスト2', 'テスト3', and 'メニュー'. Below the menu bar is a toolbar with icons for various functions. The main workspace shows a 3D model of a house with a grid overlay. The text 'SIDECS (Software) House Information Model' is prominently displayed in the center. Below this, the text 'integrated design system for customers' satisfaction' is visible, along with 'version III since 2009.1'. The interface is annotated with several callouts and boxes:

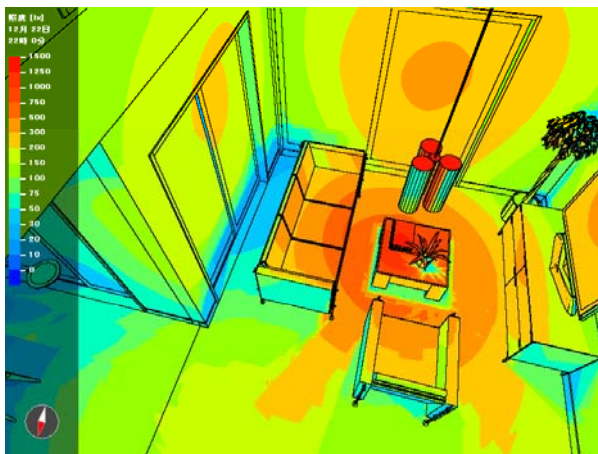
- Check for old product data**: A blue box at the top center.
- Ventilation Analysis**: A blue box on the left side.
- Specifications Automated**: A blue box on the left side.
- Structural Design Analysis**: A red box on the left side.
- Take-off Quantity to Cost Estimation**: A red box on the left side.
- Full Interoperability to Presentation • CG**: A red box at the bottom left.
- 3D Clash Detection**: A blue box on the right side.
- Daylight Analysis**: A blue box on the right side.
- Interoperable to Fabrication**: A red box on the right side.
- Interoperable to Duct Layout CAD**: A red box on the right side.
- Interoperable to Exterior CAD**: A red box on the right side.
- Data for Construction Support**: A red box at the bottom right.

The interface also shows a list of components on the left, including '名称変更' (Name Change) and '引込' (Duct) items. The bottom status bar shows the system tray with icons for 'スタート', '図面出力監視 - Y...', 'バージョン表示 - Y...', 'Sidecs実行', 'C:\WINDOWS#syst...', 'sjkt(ログイン中)', 'SIDECS_Main', and 'DigiD - [C:\Digi...'. The system clock shows '16:46'.

As of Sept. 2013

SIDECS (Detail Design): 2587 licenses

SIDECs Presentation Mode



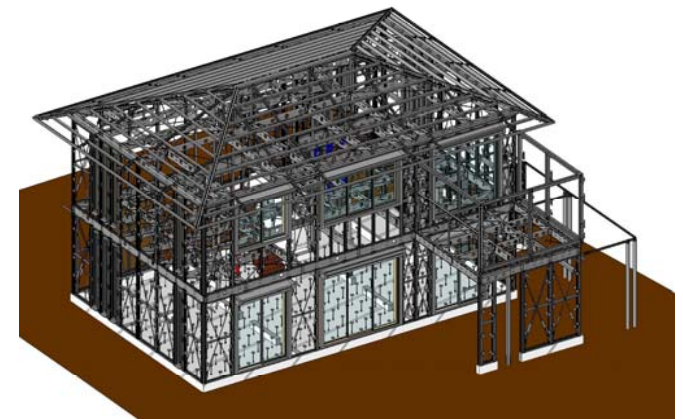
As of Sept. 2013
SIDECs-P (Presentation / Sales) :
3998 licenses

BIM Research Project



Stock House Prototype Project

2008. 08~2009. 03



location : SEKISUIHOUSE Technology R&D Institute
style of building : Sustainable building
structure : Light steel frame (original)
outer wall : Dyn's concrete (original)
building area : 1 3 2 . 4 9 m²
gross area : 1 8 7 . 2 0 m²

Revit working hours

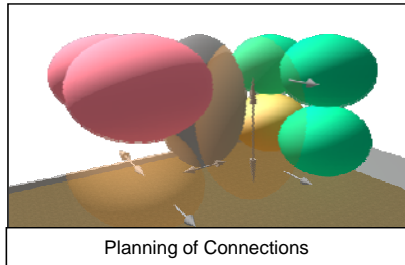
family	1 3 9
type	2 9 2
components	2 9 8 8

Exterior material and structure

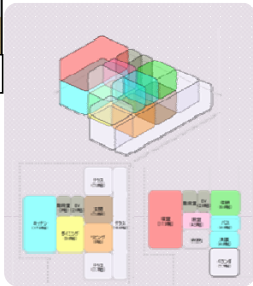
"family" Creation	1 0 1 hours
Drawings	1 0 6 hours
etc	2 6 9 hours
(modification · meeting)	

BIM Research: Stock Type House Prototype Project

Customer Information about Desired Lifestyle



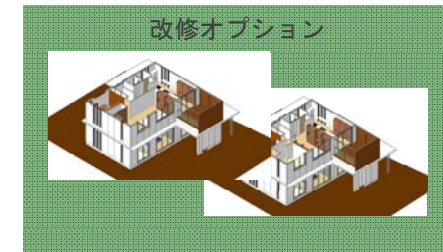
- Connection of Spaces
(Atrium • Circulation • Living Space)
- Connection of People
(Family • Relatives • Neighbor)
- Connection of Environment
(Wind • Light • Heat • Sound)



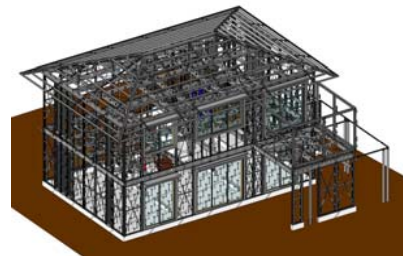
As-Build House Information



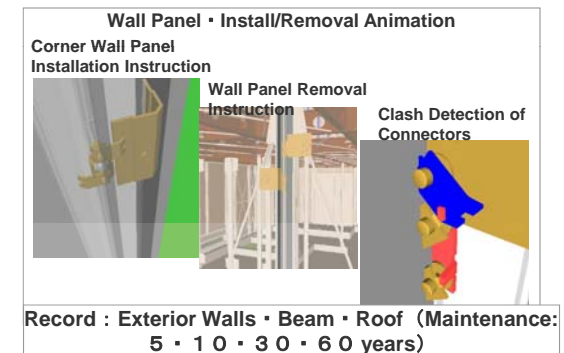
Renovation Options



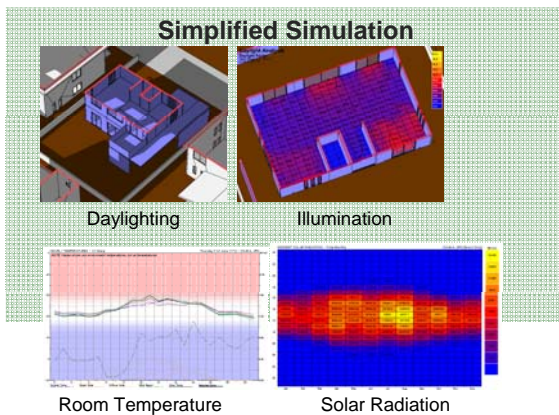
As-Build Structure Information



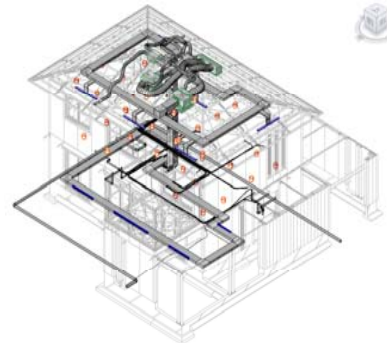
Renovation Method Information



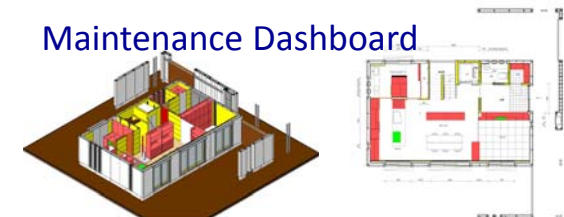
Sustainable Design Optimization



As-Build MEP Information

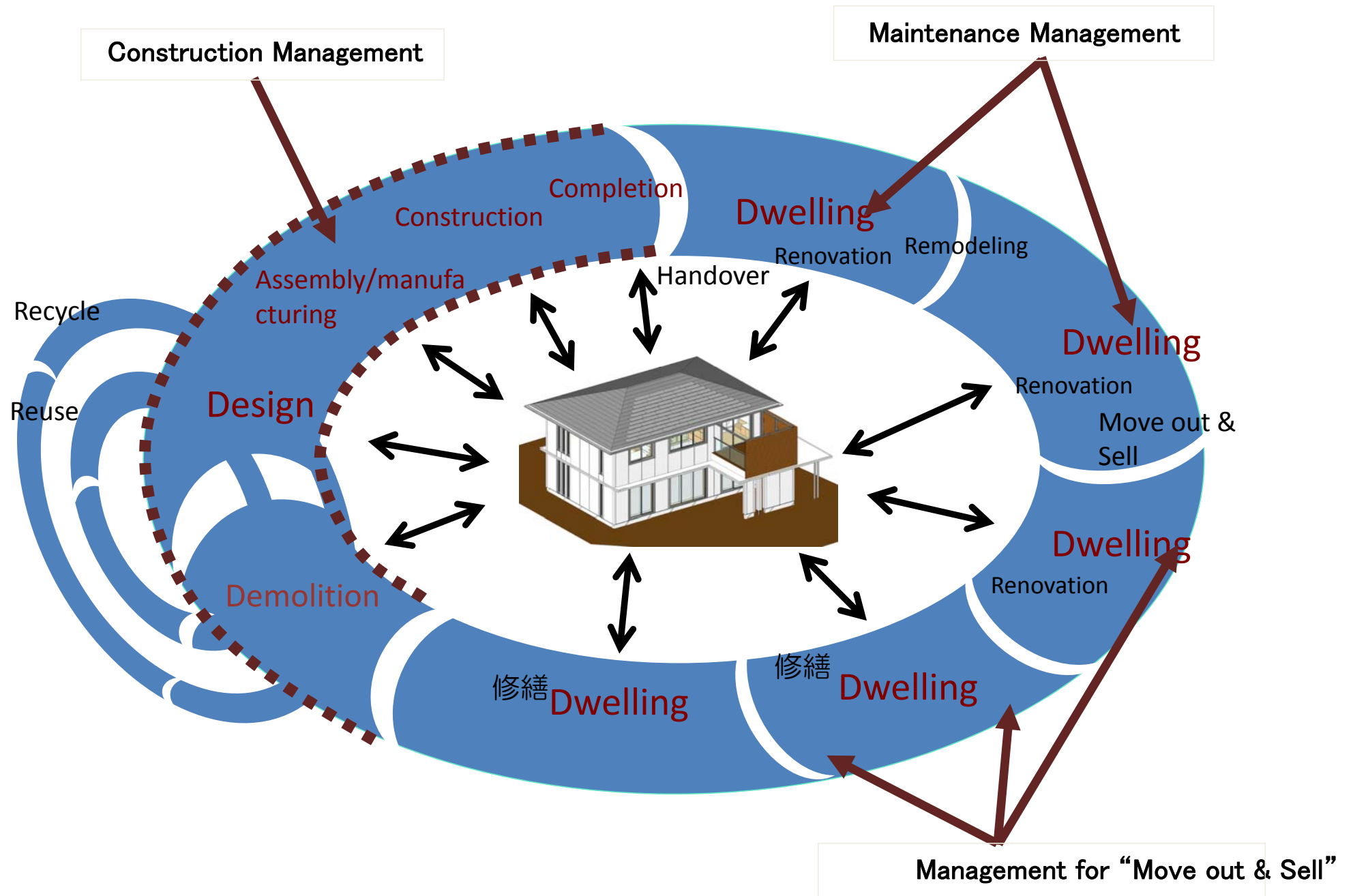


Maintenance Dashboard



From design phase, inspection points, renovation and remodel, expansion options can be visualized with the schedule and method illustrated in animation.

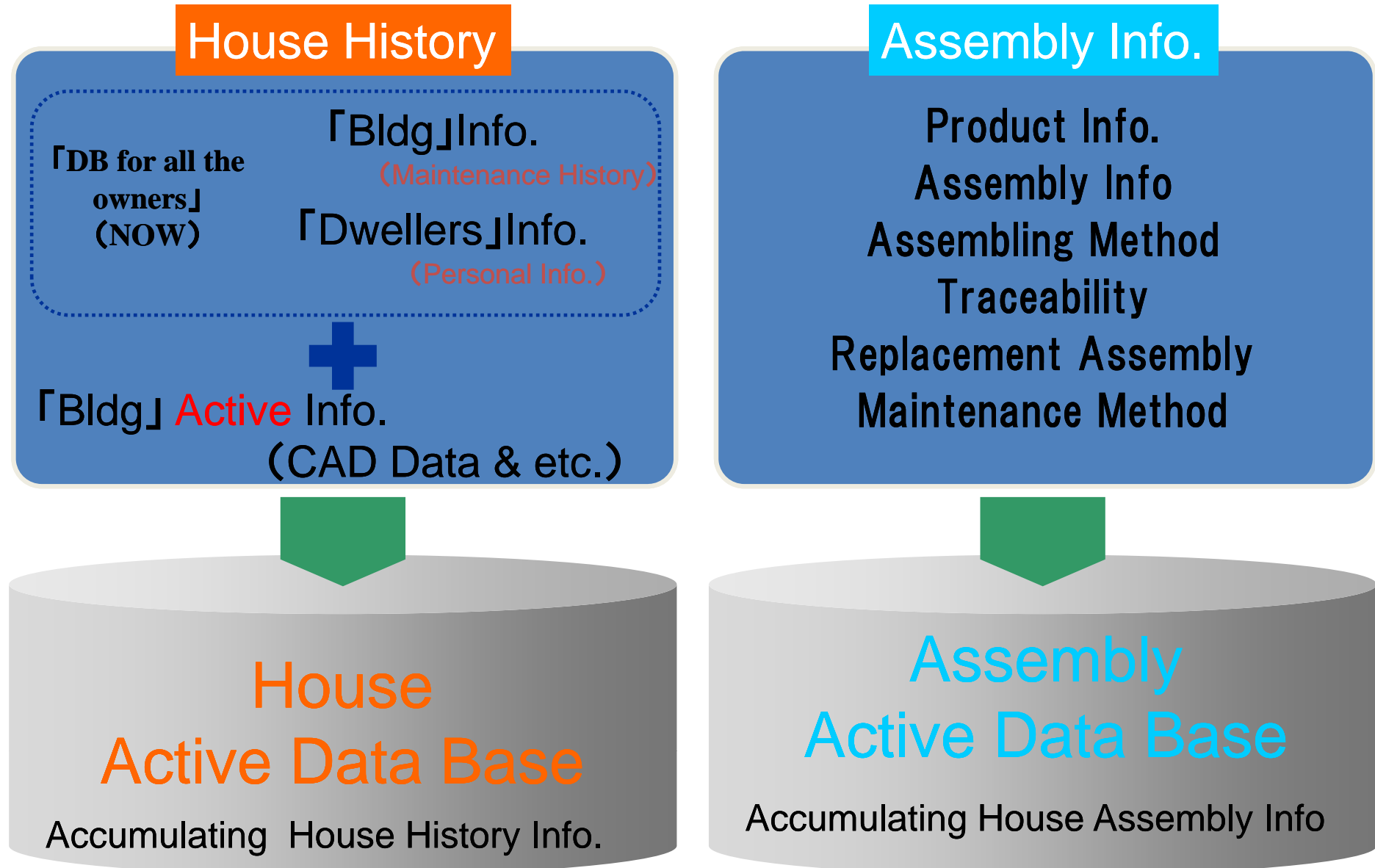
Stock Type House Life Cycle with House Information Model Database



House Life Cycle Management and As-Build Information + Dweller's Life Cycle

Quality of Data is a part of House Quality

It will be impossible to maintain the existing DB whose content is based on the "Image Data" as PDF.
We have to be the first Housing Company who builds up "Active Data Base."



The meaning of BIM for Sekisui House

The History of Sekisui House CAD System evolution
has been like BIM Approach

BIM at Sekisui House is . . .

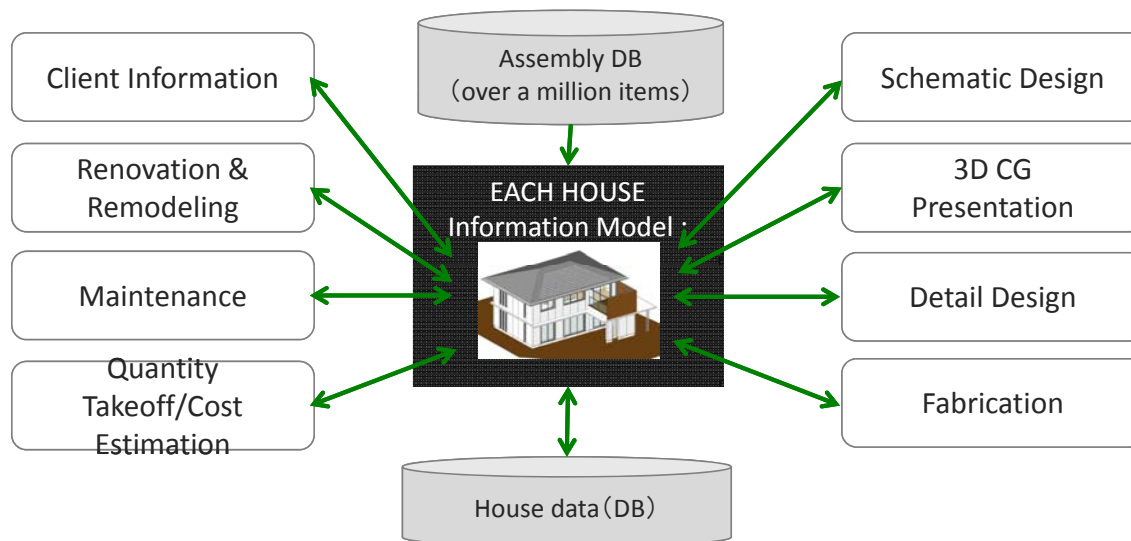
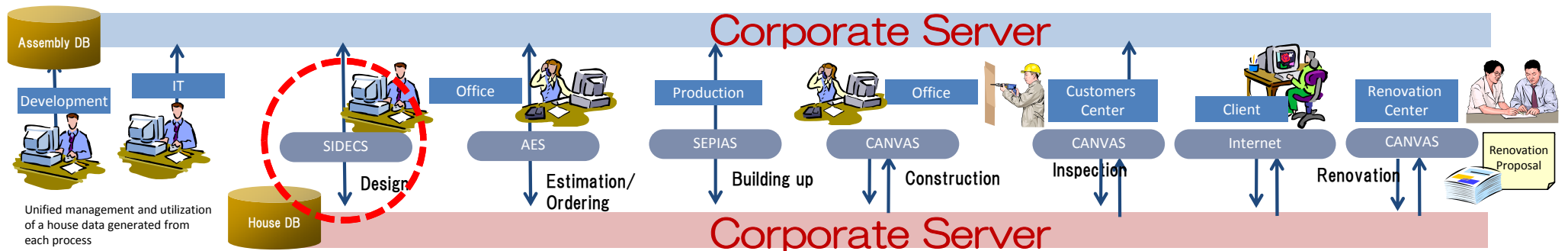
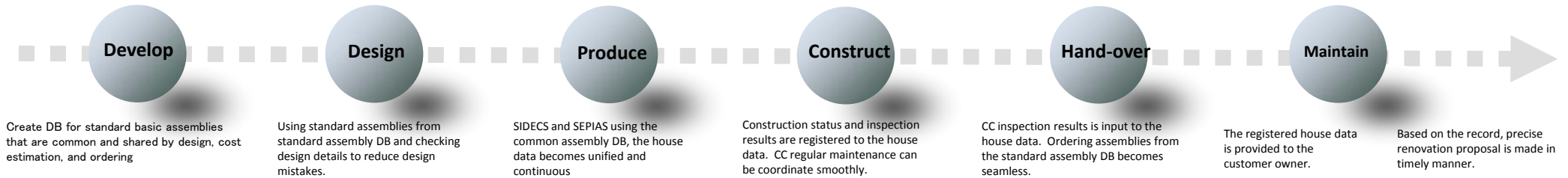
By building a common platform for house assembly data
and residence data, BIM-like thinking is used to recreate
the optimal work process of the whole company

Optimizing and Re-creating Company Workflow Based on Unified and Continuous House Data

BIM Revolution

Get rid of departmental silos, optimize the use of all resources and cost Enhance Customer Satisfaction !!

Unified and continuous information to reduce repetitive work



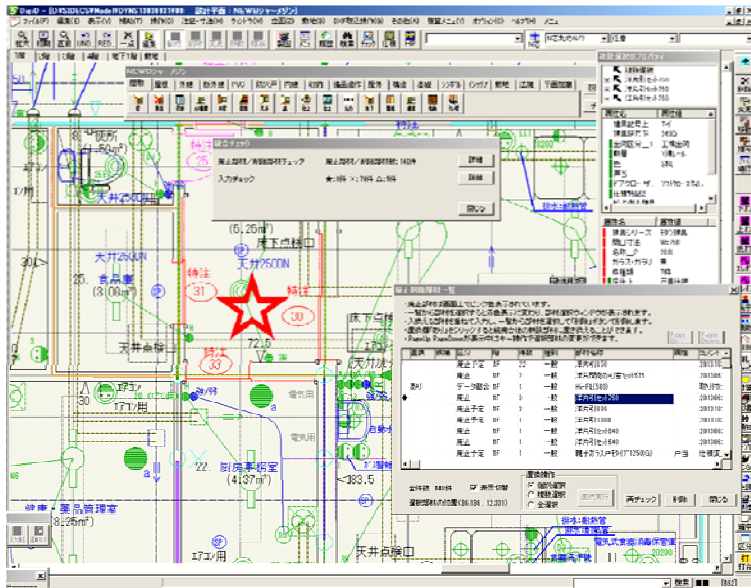
When the assembly data changes, all system will be automatically updated.
Eg. In SIDECS, discontinued assemblies will be automatically replaced in the model.

Assembly data, design rules, and structural rules will automatically check the model.

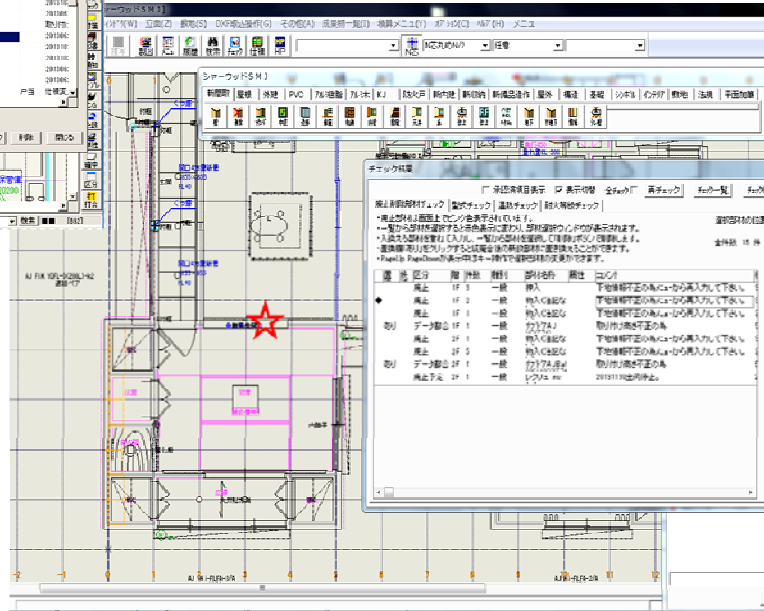
Most optimal construction schedule for the house will be created automatically.

By providing manufacturers accurate delivery lead time, it can reduce costs.

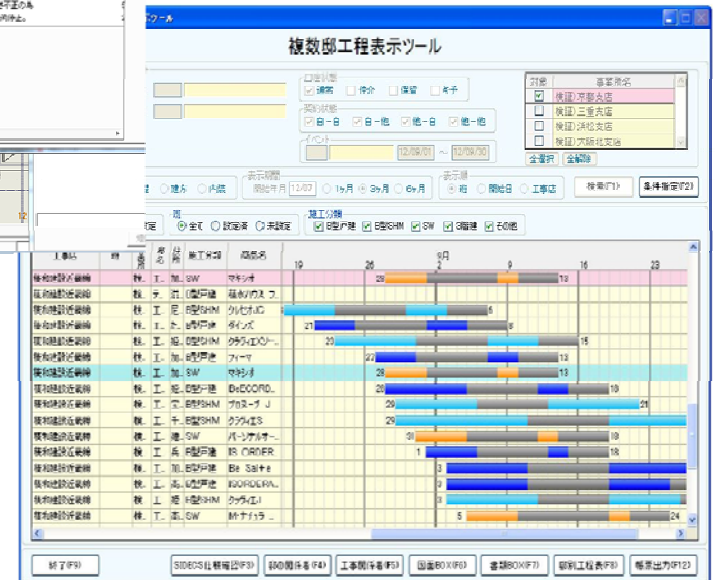
Automated House Data Process Screenshot



Discontinued Stock Check



Various Checks



Standard Construction Schedule

Frontloading Work

Productivity Through Automation

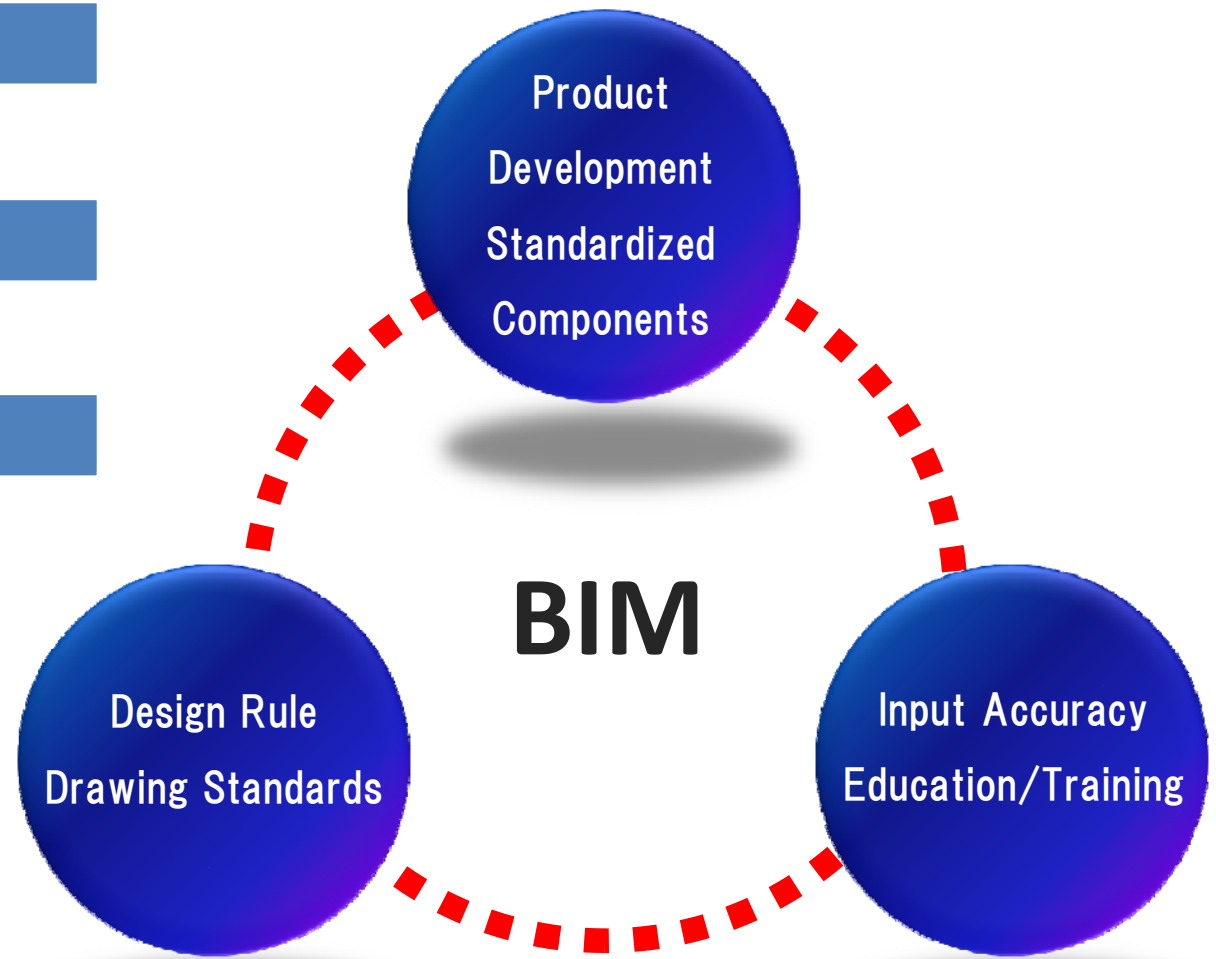
SCM Effects

BIM Effects and Operation Maintenance

Frontloading Work

Productivity thru Automation

SCM Effects

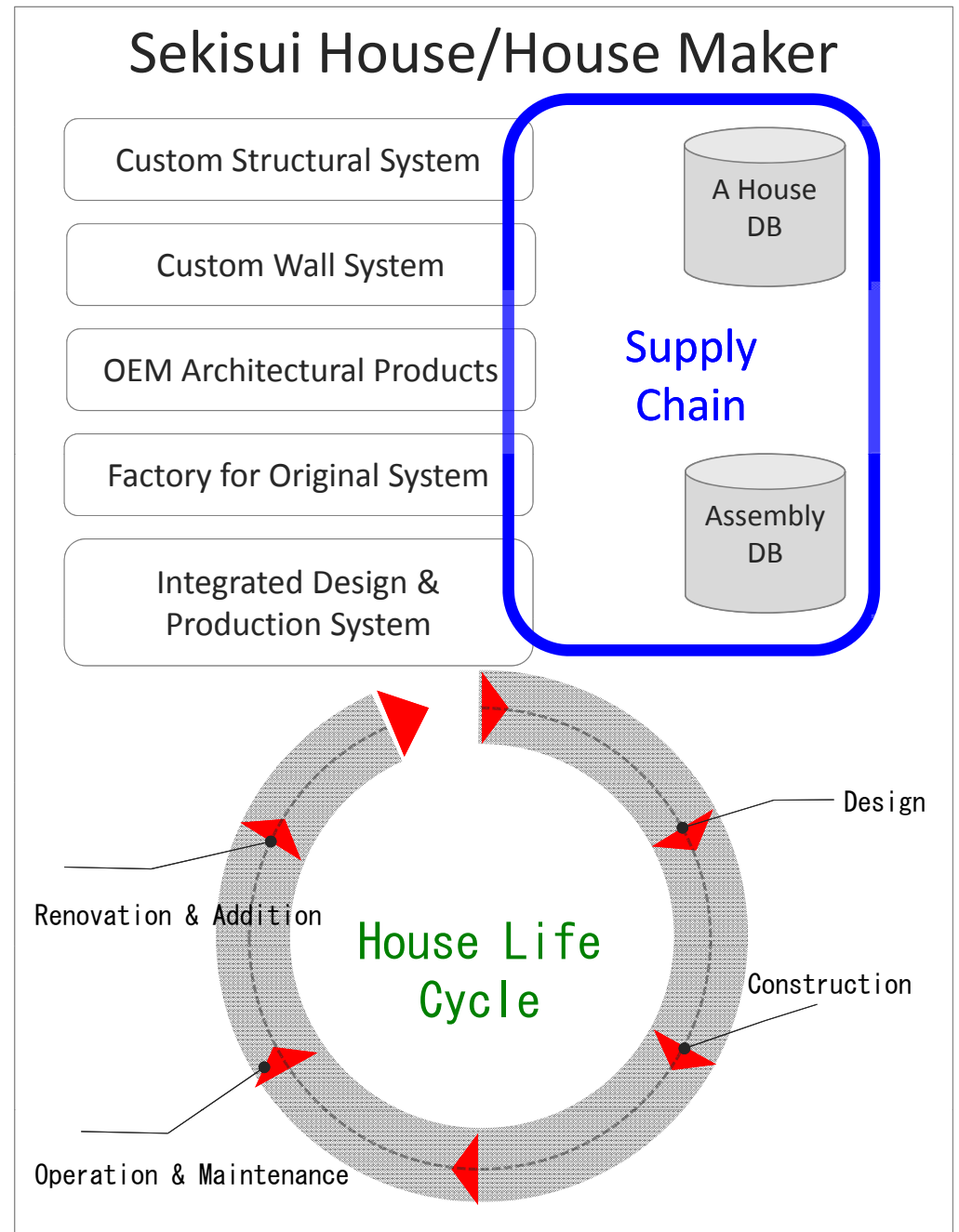
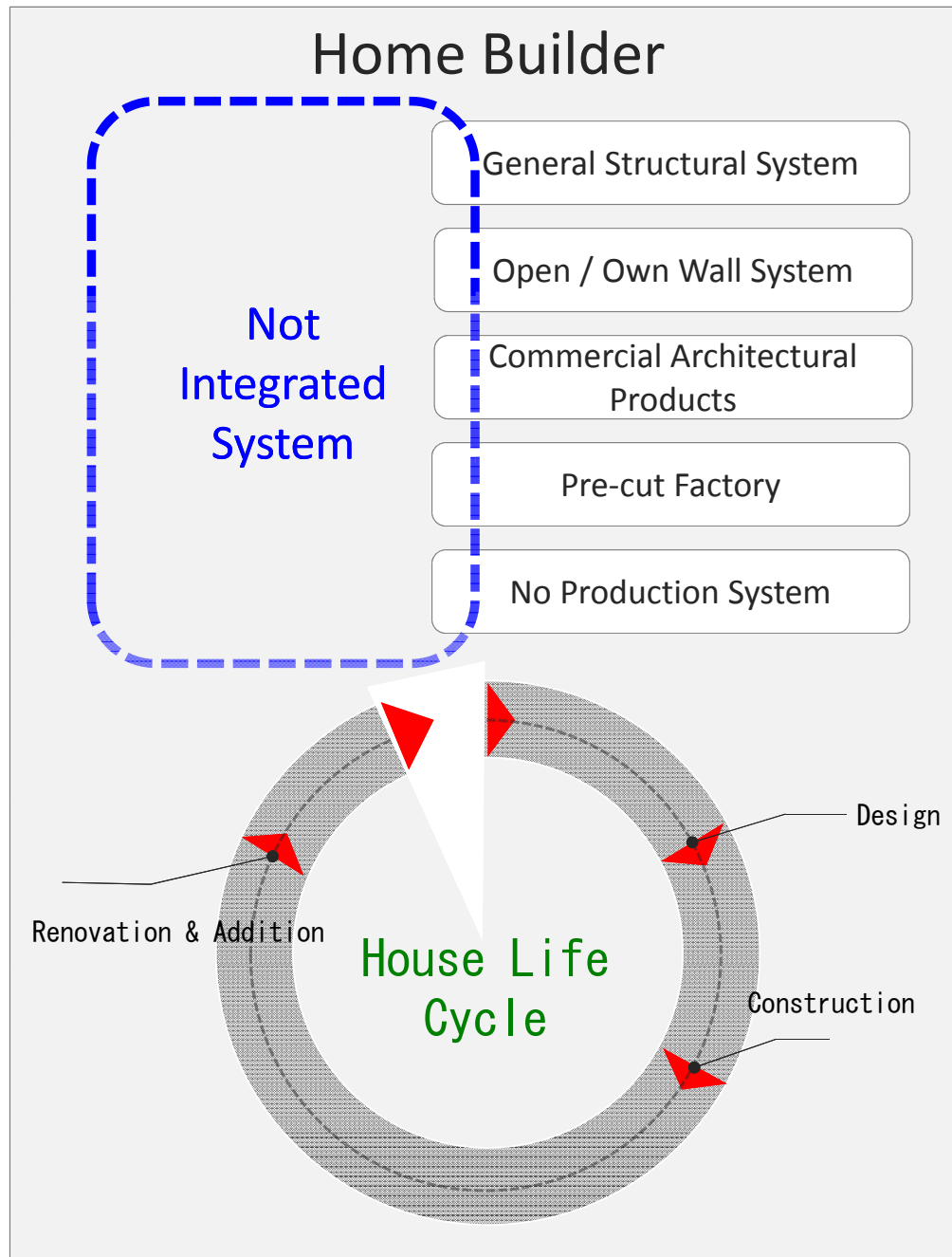


Branch/Sales office 125
Model House 431
locations

SIDECS presentation 3,998 licenses
25,000 plans/month
Sales 4,200 employees
Sales Support 400 employees

SIDECS Detail Design 2,587 units
60,000 plans/month
Design 1,600 employees
CAD operator 200 employees

BIM meets Supply Chain Management System for House Life Cycle



Sekisui House Vision as Lifestyle Creation Company

Sekisui House Envisions Future Living

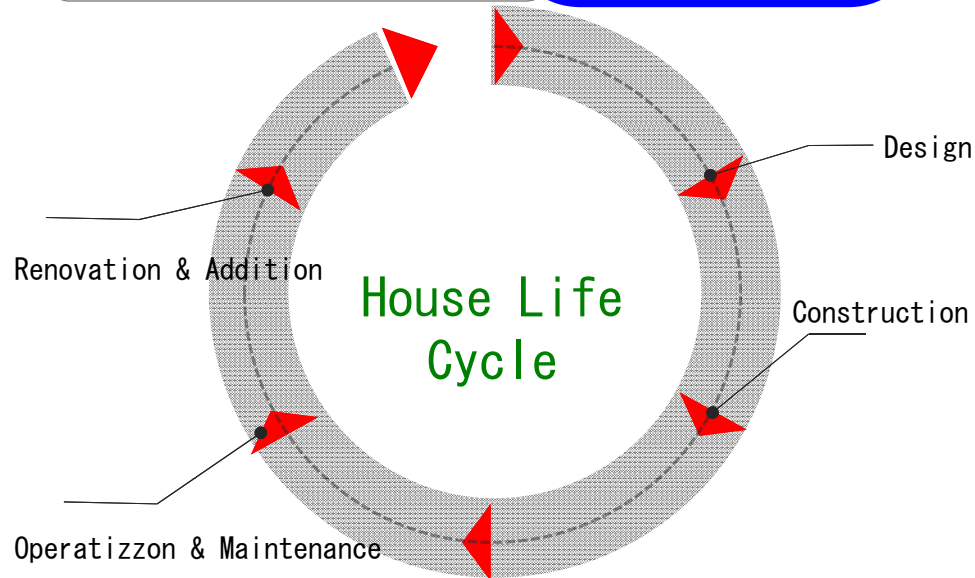
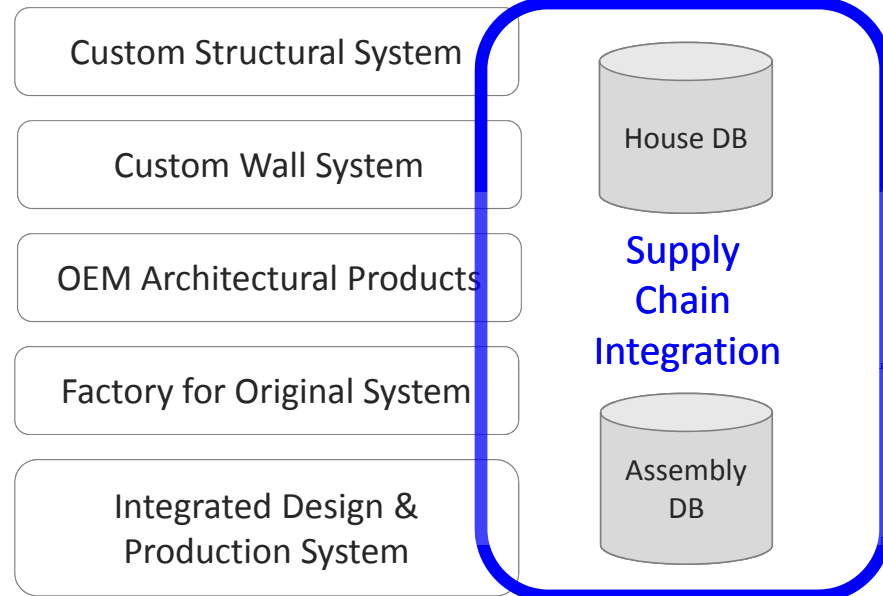
BIM→HIM

House Information Modeling

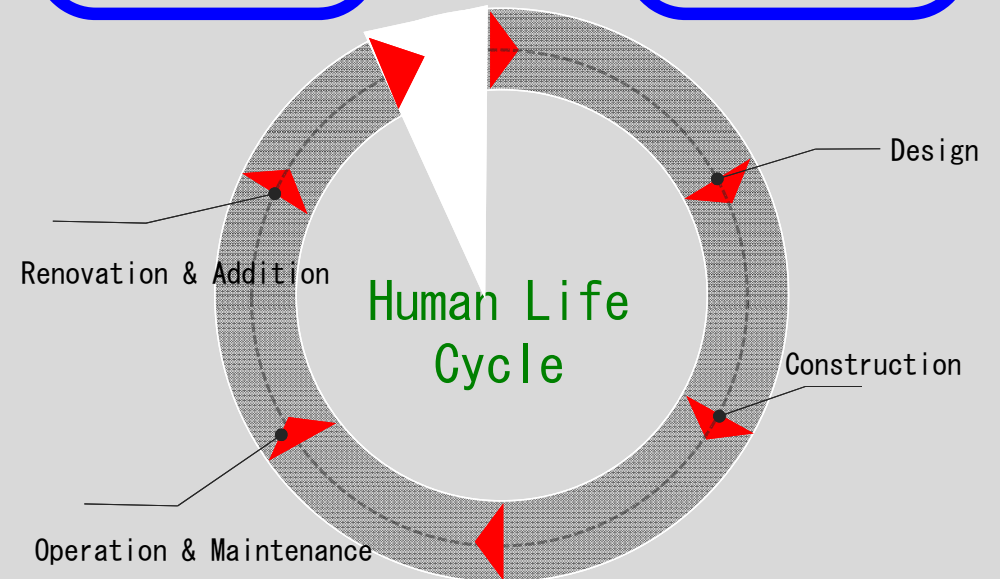
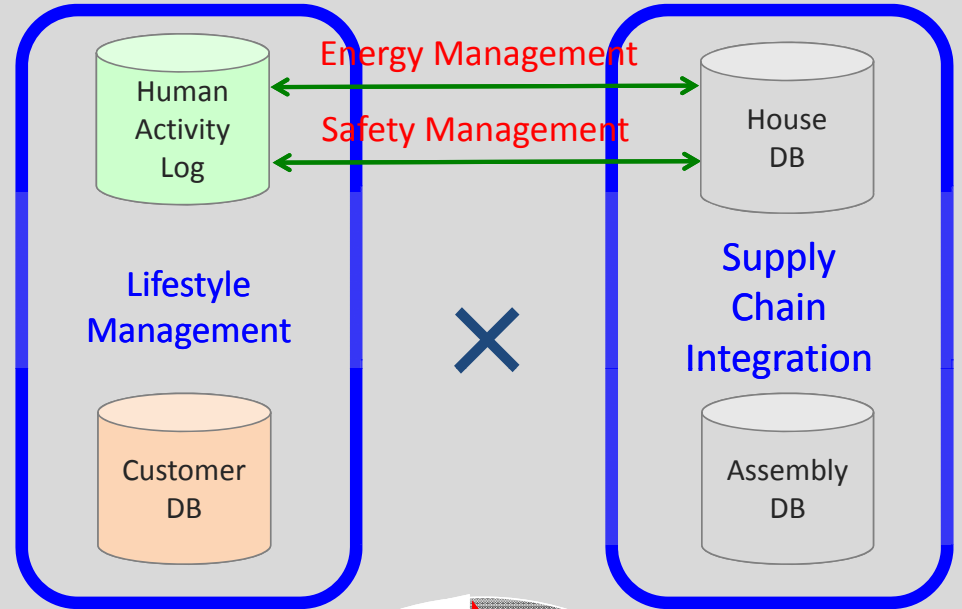
Human Information Management

BIM meets Supply Chain Management System for Human Life Cycle

House Maker



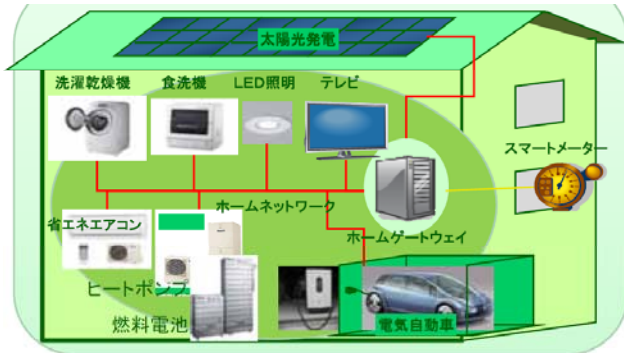
Sekisui House Human Life Cycle Management



「Dwellers-First Smart House」 Pilot Project

Smart House

Ordinary smart house concept



Ordinary smart house or smart town provides solar energy generation or fuel cell to power home appliances and electric cars as a means of eco smart living.

But something is missing.
It is the “people” living it.

In 2010, Ministry of Internal Affairs and Communications commissioned Sekisui House to build the experimental house, “Kankan Kyo”, in Yokohama to implement various environmental technology initiative.

Not only a smart house, but a new smart house with the concept of putting the dwellers in the center.

Putting **People** First



To Achieve Low Carbon Society and Enriching Humanity Lifestyle at the Same Time

観環居 “KANKAN KYO” prototype smart house

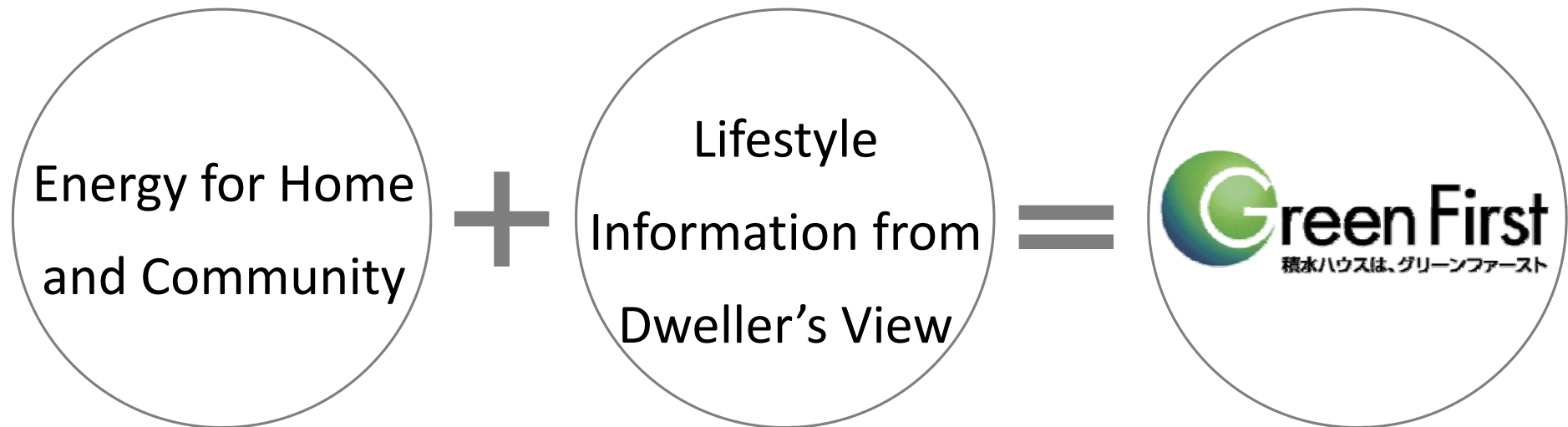


スマートハウスの未来の暮らし

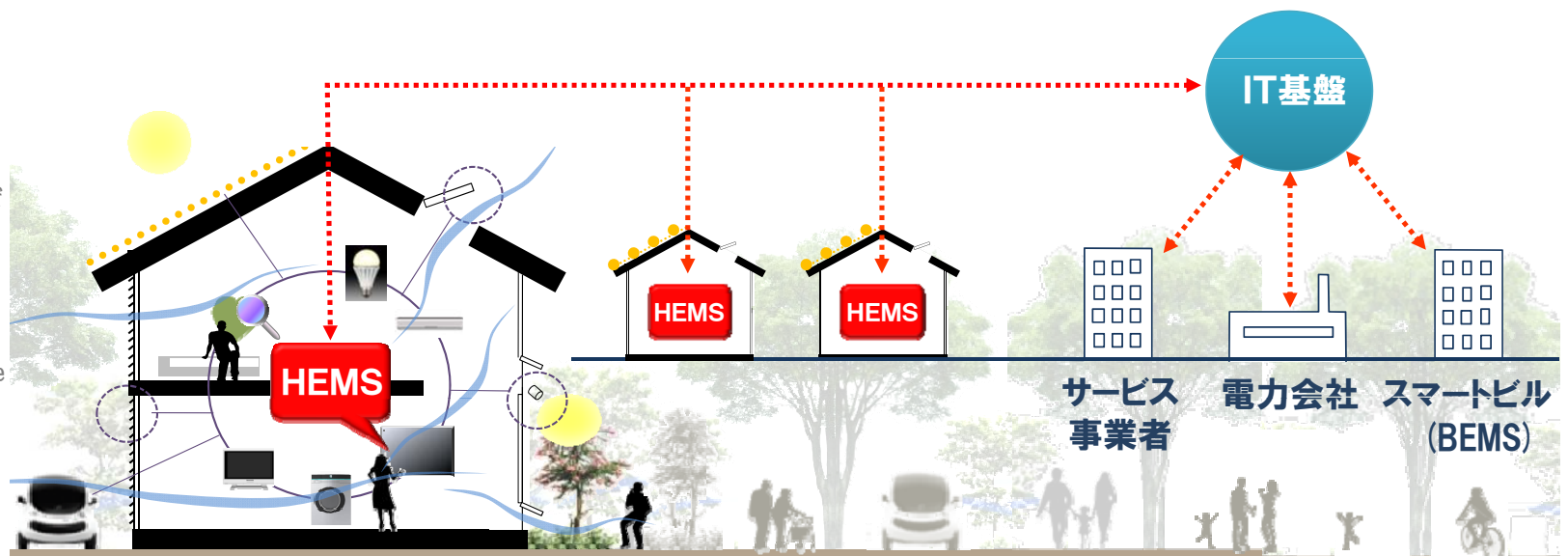
スマート・ネットワークプロジェクト実証実験住宅

「観環居」

Not only Energy but “Visualization” of Tomorrow’s Comfortable and Cozy Living



As Smart House becomes popular, energy visualization and management have suddenly accelerated at a great speed. As this type of homes comes together, the energy visualization and management in a community scale have come closer to reality. But what is really important, is the health and comfort of the dwellers. In order to make it a reality, Sekisui House has created many products based on many experiments results.



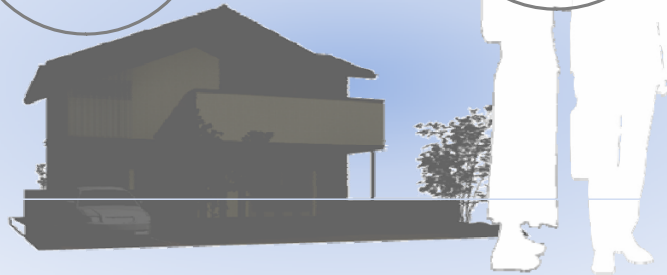
Harmony between People and Their Home Through BIM

House is an “object” that has no intelligence. When this house “object” has the highest performance, it can provide the most comfort to its dwellers. Currently, smart house represent the best type of house to deliver performance, and is slowly becoming the standard.

However, as the dweller lifestyle changes or when the house changes hand, house as an “object” cannot adjust accordingly.

Home

People



Theme: Harmony between People and Their Home

As time goes by, people change their thoughts and activities as affected by the surrounding environment. A home may begin with a couple. Before you know it, the house will be filled with children’s laughter.

When the family grows, the lifestyle changes. The home that has been spacious and comfortable may longer be the case.

Smart House



Family



The home mature with the dwellers, and experience the seasons together. A new style with dwellers and their home grow together.

HIM STYLE

Message from Home to Dweller

- Lifestyle Advice
- Safety and Security
- Energy Status
- Gardening
- Maintenance



Sekisui House Exclusive HEMS Service

Conversation between Home and Dweller

- Can you sleep well tonight?
- Did you forget to lock the door?
- Saving energy from which room?
- Better to water the plant today?
- How to use the room after kid grow up?

for the next stage

人に、街に、環境に。積水ハウス



住まいは次の快適性へ