Global BLM and Samsung SDS BLM Direction

* 삼성SDS PBLM혁신그룹

* 김태우 수석
건설 산업의 패러다임 변화

5D Solution

3D Model

Excel

2D Model / Planning
BIM vs BLM

OWNERS

BUILDERS

BUILDING INFORMATION MODELING

ARCHITECTS

MEP SYSTEMS ENGINEERS

STRUCTURAL ENGINEERS

Engineer
BIM vs BLM

BUILDING LIFECYCLE MANAGEMENT

OWNERS

ENGINEERS

ARCHITECTS

BUILDERS

MEP SYSTEMS ENGINEERS

Engineer

건설자

발주자

ARCHITECTS

STRUCTURAL ENGINEERS

Engineer

주부자
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I. Global BLM Trend

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2. 일본 추진 현황
3. 유럽 추진 현황
4. Global Best Practice
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0. Global BLM Trend
- 4D, 5D는 물론 전 Project Lifecycle을 관리하는 방향으로 발전
1. 미국 추진 현황
   - GSA(조달국) BIM 가이드를 통한 3D-4D 중심 진행

미국 BIM Guide Series 진행사항

- Guide Series 01: Overview (2007.5.14)
- Guide Series 02: Spatial Program Validation (2007.5.1)
- Guide Series 03: 3D Laser Scanning (2009.1.1)
- Guide Series 06: Circulation and Security Validation
- Guide Series 07: Building Element

BIM 활용도 증대
I. Global BLM Trend

미국 기업 BM - Bechtel
- BIM 기반의 견적-조달 관리 체계로 효과적인 프로젝트 관리

<table>
<thead>
<tr>
<th>&lt;Project Structure&gt;</th>
<th>&lt;Quantity Curve&gt;</th>
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<tr>
<td><strong>Project A</strong></td>
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<td>PSID Drawing</td>
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<td>C.S Seamless Pipe</td>
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<td>Vacuum Pump...</td>
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<td>Construction</td>
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<td>Site Preparation</td>
<td>M1</td>
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<td>Underground Piping</td>
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<td></td>
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<tr>
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</tr>
</tbody>
</table>

Forecast
2. 일본 추진 현황
   - 4D 중심의 데이터간 강력한 통합으로 발전

연혁
- 2001: 3차원 CAD 도입
- 2002: 3D Project 팀 발족
- 2003: 직원 증원의 증원 관리 구축
- 2004: 적용범위 확대
- 2005: 3D Printer 도입
- 2006: 3D Project 팀 발족
- 2007: 직원 증원 면적 참가
- 2008: 적용범위 확대
- 2009: 3D Printer 도입
- 2010: 3D 프린터 도입

Tool
- Soft Image (CG)
- VectorWork 2.5차원
- Microstation 3차원
- 3D MAX
- Tekia(구조)
- AUTO CAD 2차원
- CAPE(MEP)
- Tf@s(MEP)
2. 일본 기업 BIM
   - 4D 중심의 시뮬레이션 가상 시뮬레이션 강점

MAP CUBE : 수치지도 솔루션
   1~2년 갱신

NEXTRAX : 터치 방식의 Display
   장치, 컨텐츠 연동

Computer Graphics : 부동산, 엔터테인먼트 등 적용

SIMULATOR : 선박, 기차, 항공기 등 적용

RealTime Contents : VR를 활용하여 컨텐츠를 공급

WEB PRODUCTION : 박물관 등을 Digital화 Website 제작
3. 유럽 추진 현황
   - 5D-Initiative 회원\(^1\) 중심으로 5D BIM 개발 중

\(^1\) Ballast Nedam, Royal BAM, Consolidated Contractors Company, Max Bogl, STRABAG
3. 유럽 기업 BLM 포탈 - MAX BOGL
   - 프로젝트 전체 과정의 모든 정보를 축적, 활용
4. Global best practices
- BIM만으로는 Project Lifecycle상 일관된 정보 및 커뮤니케이션 제공하기는 어렵다.
4. Global best practice

- World Market Leader for digital design, build and (5D)
- Headquarters in Stuttgart in 1961
- 15,000 customers worldwide
- 400 employees worldwide including 250 in development
- Debt Free: EUR 115 million in cash
4. Global best practice

- RIB는 ERP 완벽한 통합 지원, 상위 15개 글로벌 시공사 중 33% 사용

<table>
<thead>
<tr>
<th>2008 Ranking</th>
<th>2007 Ranking</th>
<th>Contractors (By out of home town project value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>HOCHTIEF AG, ESSEN, GERMANY</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>VINCI, RUEIL-MALMAISON, FRANCE</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>SKANSKA AB, SOLNA, SWEDEN</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>STRABAG SE, VIENNA, AUSTRIA</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>BOUYGUES, PAIRS, FRANCE</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>BECHTEL, SAN FRANCISCO, CALIF, U.S.A.</td>
</tr>
<tr>
<td>7</td>
<td>**</td>
<td>SAIPEM, SAN DONATO MILANESE, ITALY</td>
</tr>
<tr>
<td>8</td>
<td>7</td>
<td>TECHNIP, PAIRS LA DEFENSE, FRANCE</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>BILFINGER BERGER AG, MANNHEIM, GERMANY</td>
</tr>
<tr>
<td>10</td>
<td>12</td>
<td>BOVIS LEND LEASE, MILLERS POINT, NSW, AUSTRALIA</td>
</tr>
<tr>
<td>11</td>
<td>10</td>
<td>FLUOR CORP., IRVING, TEXAS, U.S.A.</td>
</tr>
<tr>
<td>12</td>
<td>11</td>
<td>ROYAL BAM GROUP NV, BUNNIK, THE NETHERLANDS</td>
</tr>
<tr>
<td>13</td>
<td>22</td>
<td>FCC, FOMENTO DE CONSTR. Y CONTRATAS SA, MADRID, SPAIN</td>
</tr>
<tr>
<td>14</td>
<td>20</td>
<td>BALFOUR BEATTY PLC. LONDON, U.K.</td>
</tr>
</tbody>
</table>
### 4. Global best practice

<table>
<thead>
<tr>
<th>RANK</th>
<th>FIRM NAME</th>
<th>LOCATION</th>
<th>2010 Revenue (US$ Million)</th>
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<tbody>
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<td>52044</td>
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<td>2</td>
<td>CHINA RAILWAY GROUP LTD.,</td>
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<tr>
<td>3</td>
<td>VINCI</td>
<td>Rueil-Malmaison, France</td>
<td>45498</td>
</tr>
<tr>
<td>4</td>
<td>CHINA STATE CONSTRUCTION ENG’G CORP.,</td>
<td>Beijing, China</td>
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</tr>
<tr>
<td>5</td>
<td>BOUYGUES</td>
<td>Paris, France</td>
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<td>6</td>
<td>CHINA COMMUNICATIONS CONSTRUCTION GRP.,</td>
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<td>BECHTEL</td>
<td>San Francisco, Calif., U.S.A.</td>
<td>30800</td>
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<tr>
<td>8</td>
<td>HOCHTIEF AG,</td>
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<td>9</td>
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<tr>
<td>10</td>
<td>ACS</td>
<td>Spain</td>
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<td>FCC, FOMENTO DE CONSTR. Y CONTRATAS SA,</td>
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<td>Spain</td>
<td>17280</td>
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<tr>
<td>18</td>
<td>DALWA HOUSE</td>
<td>Japan</td>
<td>17201</td>
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<td>Tokyo, Japan</td>
<td>16981</td>
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<td>14824</td>
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<td>22</td>
<td>SAIPEM</td>
<td>Italy</td>
<td>14705</td>
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<tr>
<td>23</td>
<td>SEKISUI HOUSE</td>
<td>Japan</td>
<td>14458</td>
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<td>24</td>
<td>OYABASHI CORPORATION</td>
<td>Japan</td>
<td>14333</td>
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<td>25</td>
<td>BALFOUR BEATTY PLC,</td>
<td>London, U.K.</td>
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</tbody>
</table>
4. Global best practices

- 1961년 설립(독일, 중국개발센터) 약 15,000 고객/ 100,000 USERS
4. Global best practices
- 3D 모델 및 프로세스 기반 4D/5D BIM 통합 솔루션

RIB iTWO - First Integrated Software Solution for Building Industry

<table>
<thead>
<tr>
<th>Design</th>
<th>Costing</th>
<th>E-Tender</th>
<th>Contractor</th>
<th>Revenue</th>
</tr>
</thead>
</table>

CAD  ERP
4. Global best practices

- RIB솔루션은 ERP와의 완벽한 통합이 가능하게 함.
RIB iTWO BIM Import & Model Checking
<table>
<thead>
<tr>
<th>Description</th>
<th>Outline Spec</th>
<th>Quantity</th>
<th>Unit Rate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frames</td>
<td></td>
<td>141.60</td>
<td>141.60</td>
<td>668,800.25</td>
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<tr>
<td>Upper Floors</td>
<td></td>
<td>20.35</td>
<td>20.35</td>
<td>40,680.39</td>
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<tr>
<td>Roof</td>
<td></td>
<td>283.88</td>
<td>283.88</td>
<td>80,060.02</td>
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<tr>
<td>External Works</td>
<td></td>
<td>284.34</td>
<td>284.34</td>
<td>80,000.00</td>
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</tbody>
</table>

2.5.2.2 External walls below ground floor level: Definition: External enclosing walls below ground floor level that are not formed by retaining walls

<table>
<thead>
<tr>
<th>Description</th>
<th>Outline Spec</th>
<th>Quantity</th>
<th>Unit Rate</th>
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<tr>
<td>2.5.2.2.1</td>
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<td>47,062.79</td>
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2.6 Windows and External Doors

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4.2 Internal Finishes

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<th>Total</th>
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<td>263.116.10</td>
<td>263.116.10</td>
<td>263.116.10</td>
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4.3 Fittings, Furnishings and Equipment

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5. Services

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<td>4,433.37</td>
<td>4,433.37</td>
<td>4,433.37</td>
</tr>
</tbody>
</table>

RIB iTWO Bill of Quantities (QTO + Unit Cost)
RIB iTWO 5D Simulation
Real Time Forecasting
RIB iTWO Progressive Job Cost Analysis
Earned Value Method (EVM)
4. Global best practice

- RIB솔루션의 사용으로 기대되는 평균적인 효과는 15%정도임

<table>
<thead>
<tr>
<th>No.</th>
<th>Item of Criteria</th>
<th>Range of Saving</th>
<th>Estimated Saving</th>
<th>Benefit (%)</th>
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<tbody>
<tr>
<td>1</td>
<td>Earlier completion of the project</td>
<td>1 ~ 24 mths</td>
<td>2 mths</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>Project return (yield)</td>
<td>4% ~ 15%</td>
<td>6%</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Engineering saving</td>
<td>10% ~ 30%</td>
<td>20%</td>
<td>1%</td>
</tr>
<tr>
<td>3</td>
<td>Purchasing out of 3D model with earlier identification &amp; global search</td>
<td>2% ~ 6%</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td>4</td>
<td>Reduction of clashes, saving time and change orders</td>
<td>40% ~ 90%</td>
<td>60%</td>
<td>3%</td>
</tr>
<tr>
<td>5</td>
<td>Accurate billing &amp; invoicing reducing the liquidity</td>
<td>5% ~ 25%</td>
<td>20%</td>
<td>1%</td>
</tr>
<tr>
<td>6</td>
<td>Getting 10% more orders due to accurate QTO and cost estimation</td>
<td></td>
<td></td>
<td>3%</td>
</tr>
<tr>
<td>7</td>
<td>Getting higher price for using leading project solution</td>
<td>1% ~ 10%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>8</td>
<td>Increase capacity</td>
<td></td>
<td></td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td><strong>Total Benefits</strong></td>
<td></td>
<td></td>
<td><strong>15%</strong></td>
</tr>
</tbody>
</table>
5. SEDICs

- SEDICs ¹) : 웹 기반의 도면/문서 관리 및 4D/5D 수행하는 시스템

1) SEDICs : Samsung Enterprise Design Integrated Construction system
5. SEDICs

- SEDICs: 웹 기반의 도면/문서 관리 수행하는 시스템

- 강력한 Markup 기능
- 회의 내용 및 markup tree 구조 표시 창
- 회의 참석자 확인 및 회의 채팅 창.
5. SEDICs

- SEDICs: 웹 기반의 4D/5D 를 수행하는 시스템

- 비교 공정에 따른 도면 시뮬레이션

- 동일한 도면에 대한 비교 공정 시뮬레이션

- 비교 공정에 따른 건적 시뮬레이션
II. SDS BLM

1. SDS BLM Service

2. SDS BLM PLATFORM

3. SDS BLM ROADMAP

4. Summary
1. SDS BLM Service 소개

BLM 컨설팅

- BLM 수준 진단 컨설팅
- BLM 분류체계 및 기준 수립
- BLM Master Plan 수립 및 컨설팅

BLM 시스템 개발

- 본사-현장 BLM 인프라 구축
- 맞춤형 BLM 시스템 개발
- 전문 솔루션 도입을 통한 시스템 개발

BLM 서비스

- 솔루션/시스템에 대한 교육 서비스
- 전문 운영 조직과 연계한 시스템 운영
- 본사-현장 BLM 인프라 유지 관리
1.1 BLM 컨설팅
- 전사 Master Plan 수립 및 컨설팅 수행

BIM 수준진단 컨설팅

Master Plan 기획
1.2 BLM 시스템 개발
   – SDS 고유의 BLM시스템 및 글로벌 솔루션 개발

**Level 1**
현장 BLM 인프라 구축

특징
- 현장 별 포탈
- 실시간 협업
- 간섭 체크와 같은 모델 리뷰

모듈
- 도면관리(2D/3D)
- 협업관리
- 파일 스키마 관리

**Level 2**
맞춤형 BLM 시스템 개발

특징
- 엔터프라이즈 포털
- 개산견적 산출 시뮬레이션
- 공정 비교 시뮬레이션

모듈
- 프로젝트 관리
- 4D 시뮬레이션 관리
- 견적/공정 데이터 관리

**Level 3**
전문 솔루션 도입을 통한 시스템 개발

특징
- ERP 연계
- 조달/구매 기능
- 공정 관리 및 5D

모듈
- 통합 4D/5D 시뮬레이션
- 조달/구매 관리

<현재 위치>
2. SDS BLM Platform (SBP)
   - SDS BLM은 Design/Construction/FM Based Platform Service
3. SDS BLM Roadmap

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<th>2012.1</th>
<th>2012.7</th>
<th>2013.1</th>
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<td>1 단계</td>
<td>2 단계</td>
<td>3 단계</td>
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<tr>
<td>SBP V1.0</td>
<td>SBP Council</td>
<td>SBP V2.0</td>
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<th>안정기/기반확대</th>
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<td>• Open API 기반 플랫폼</td>
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<td>• K- BLM</td>
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발전단계 2012.1, 2012.7, 2013.1
핵심전략 4D, 5D 연동 구축, IT 건설사 (10사), IT 건설사 (20사)
목표 Open API 기반 플랫폼, SBP Council 발족, K- BLM
4. Summary

1. BLM은 BIM의 성숙도를 기반으로 발전해야함

2. BLM의 성공은 ERP와의 통합으로 완성된다.

3. BLM은 이제 더 이상의 선택이 아니다