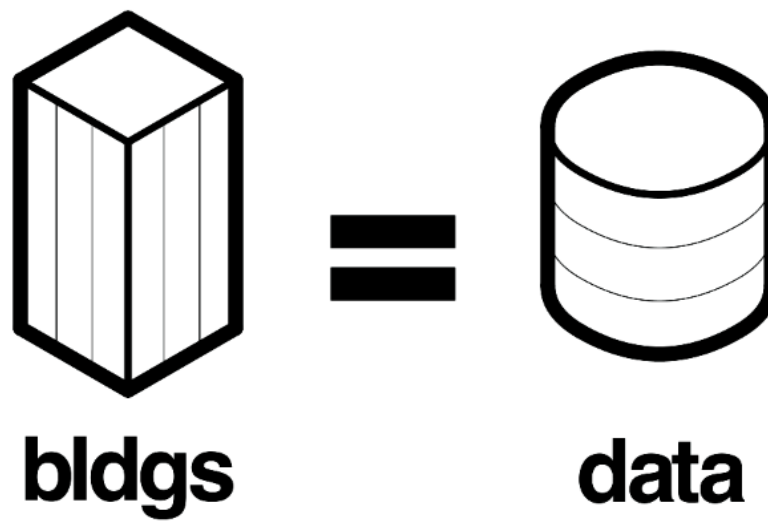
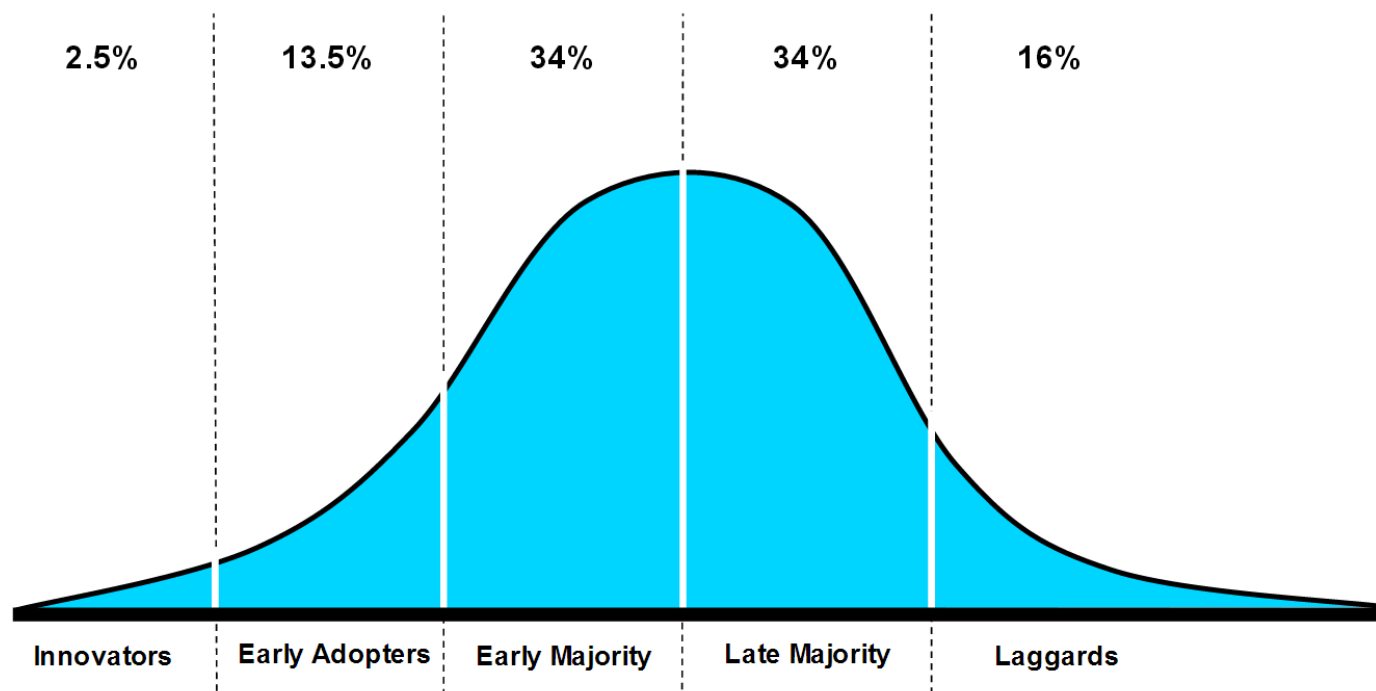


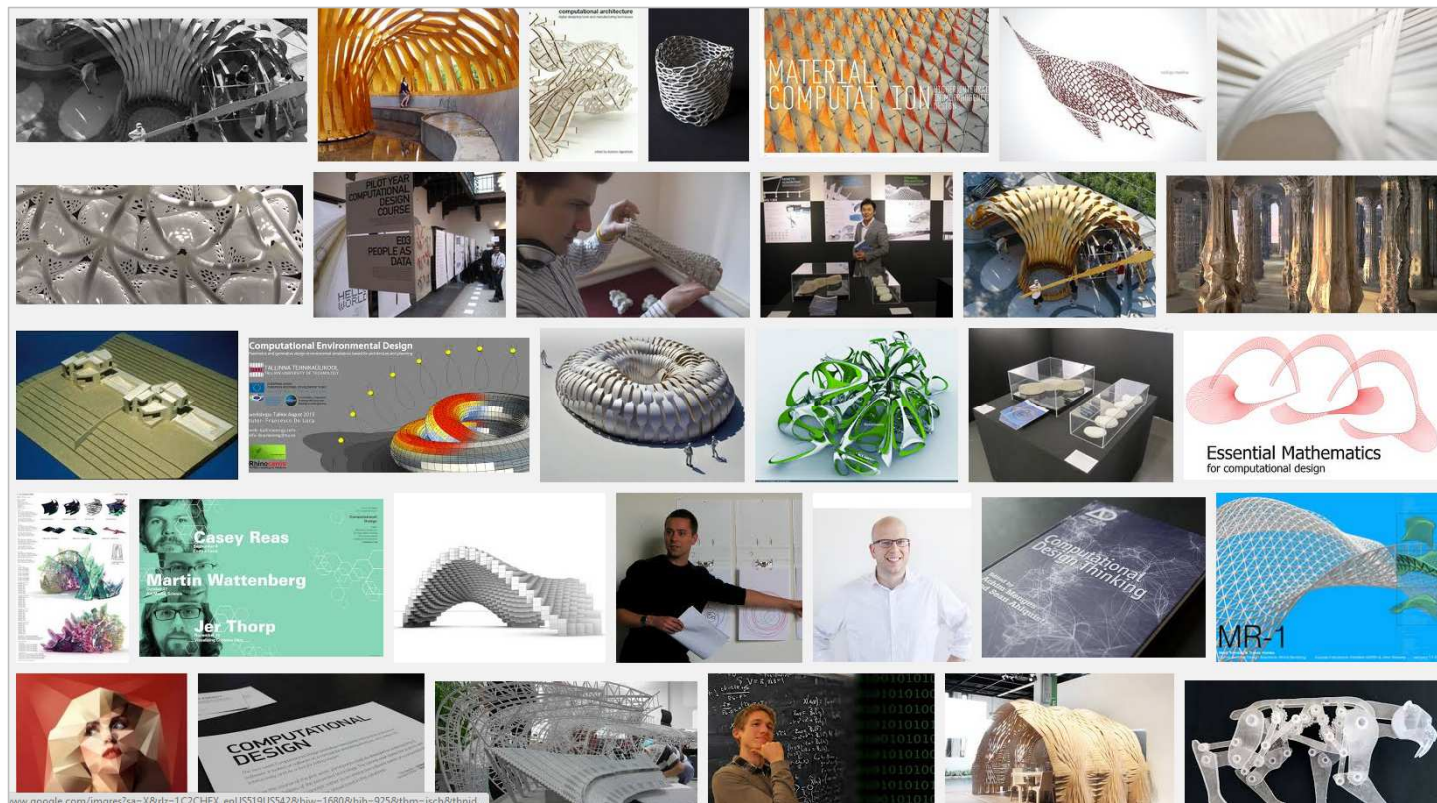


case

Innovation Curve



case



case

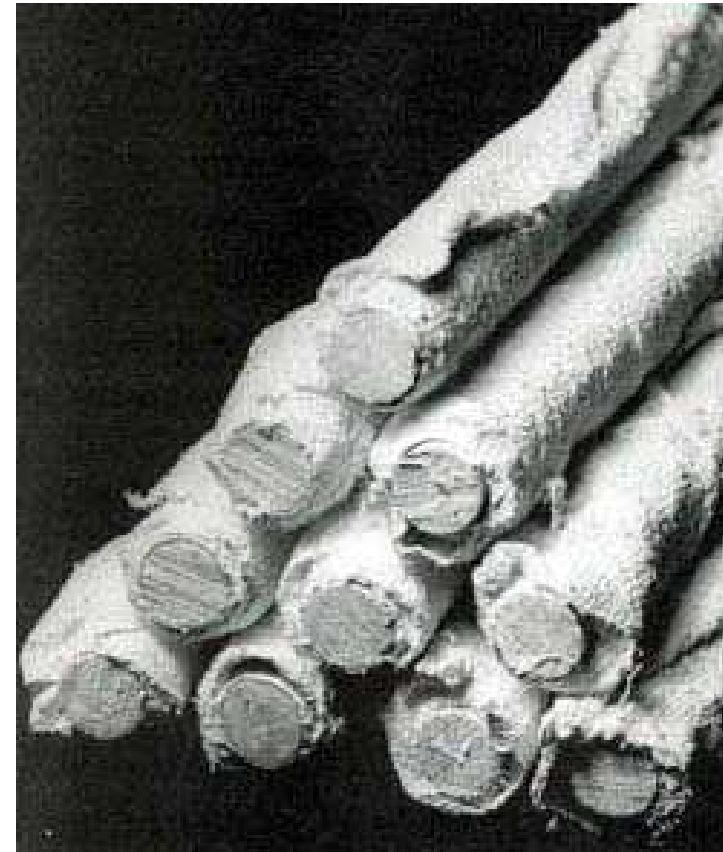
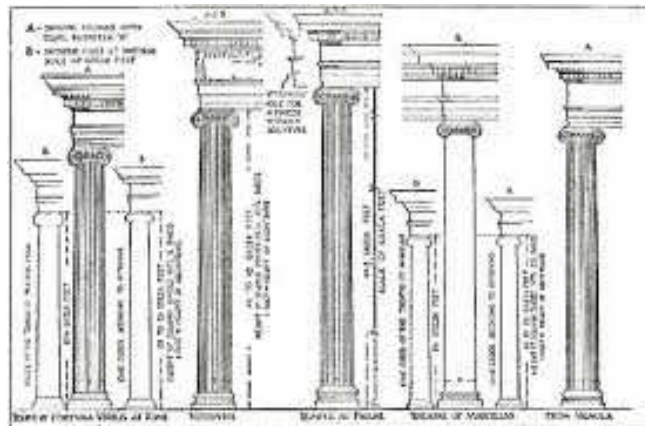
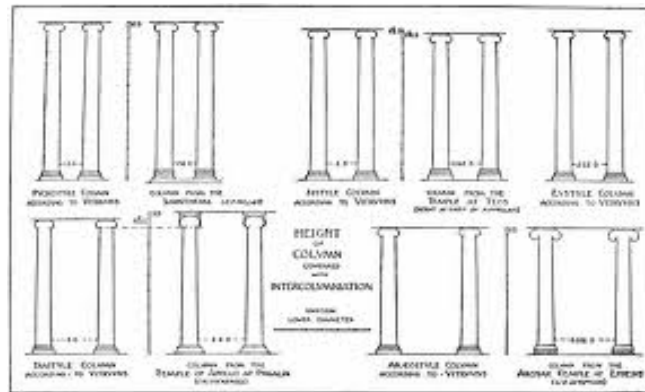
Context

case

Ten Books on Architecture

Vitruvius

circ. 15 BC

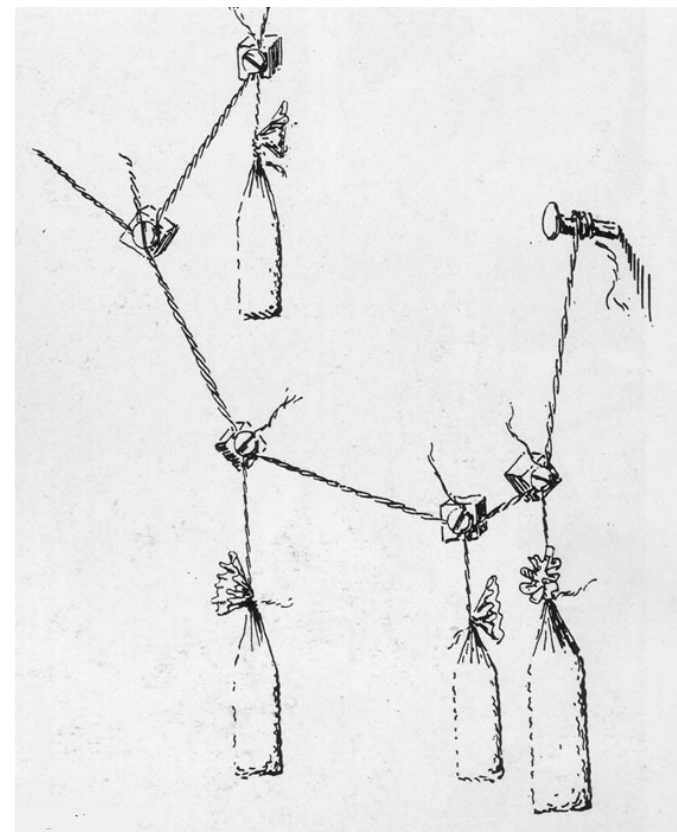


case

Colonia Güell

Antoni Gaudi

Circ. 1910

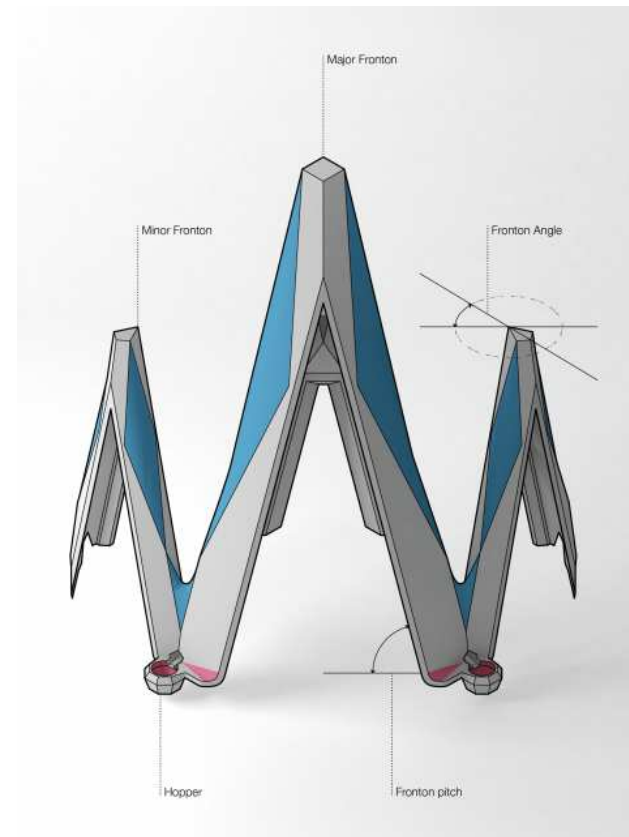


case

Sagrada Familia

Antoni Gaudi

Visualization (1945), Parametric Model (2011)

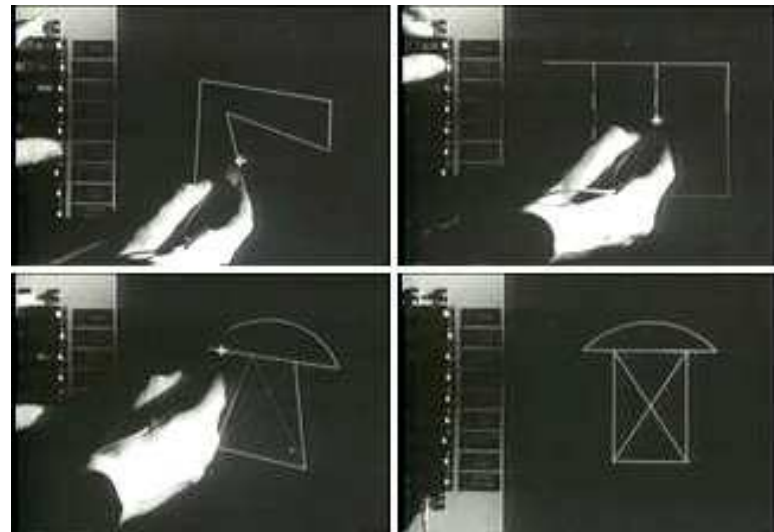
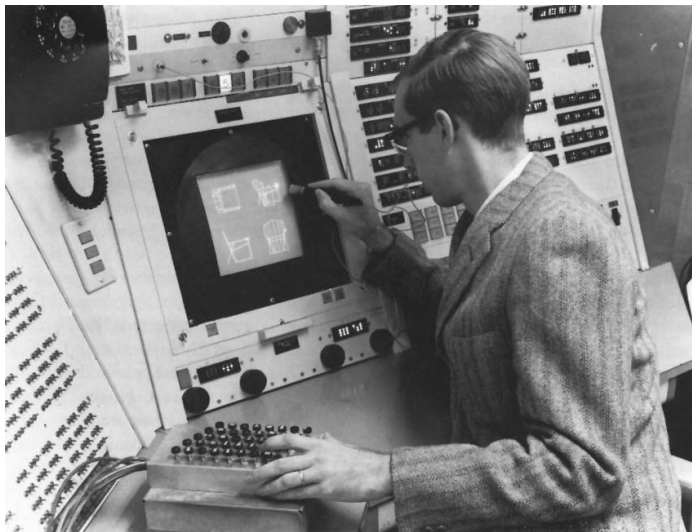


case

Sketchpad

Ivan Sutherland

1962

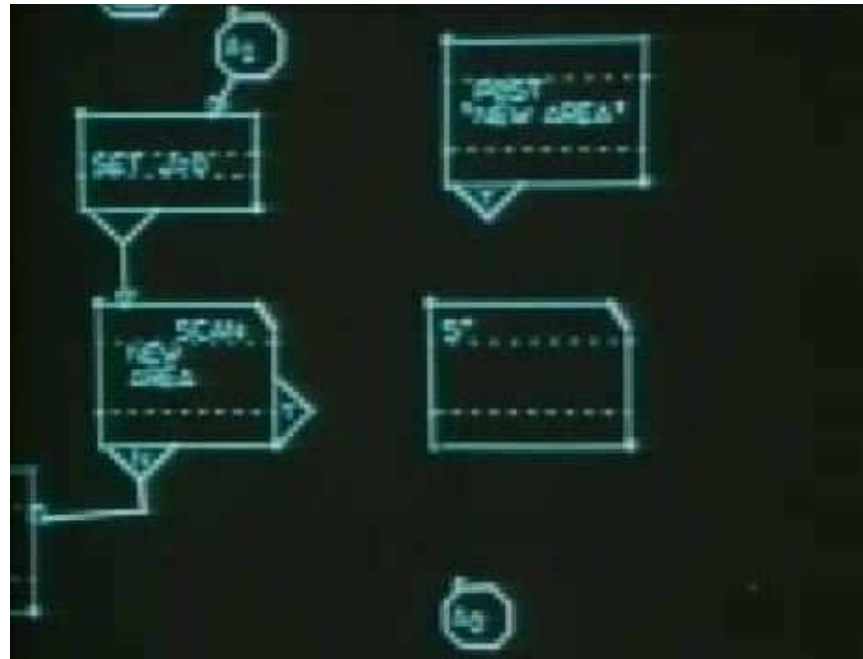
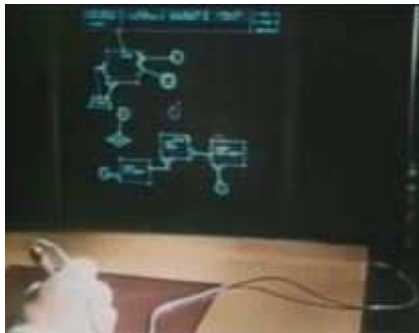


case

GRAIL

Graphical Input Language

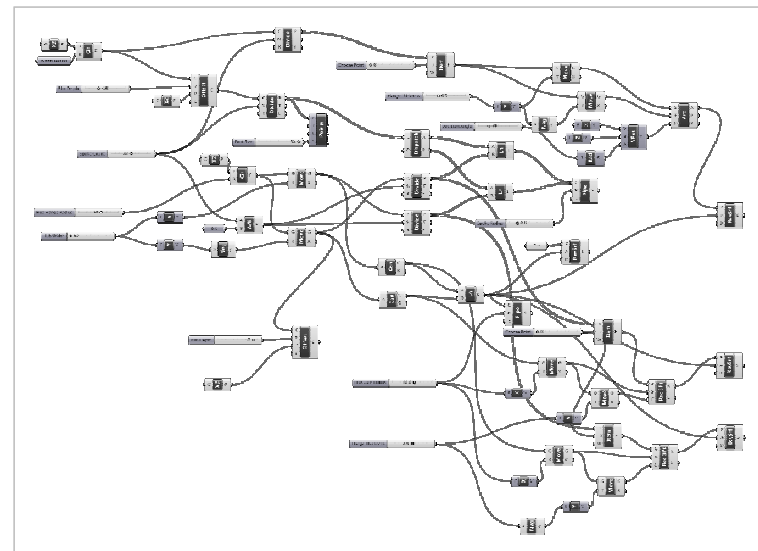
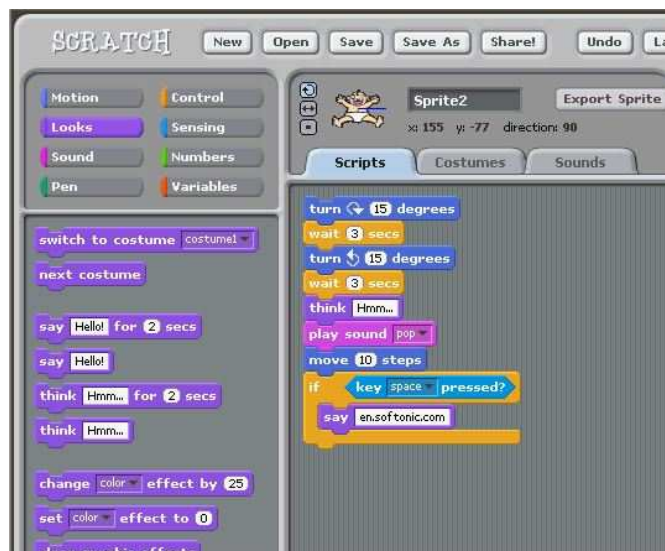
1968



case

Graphical Programming

Visual Languages



case

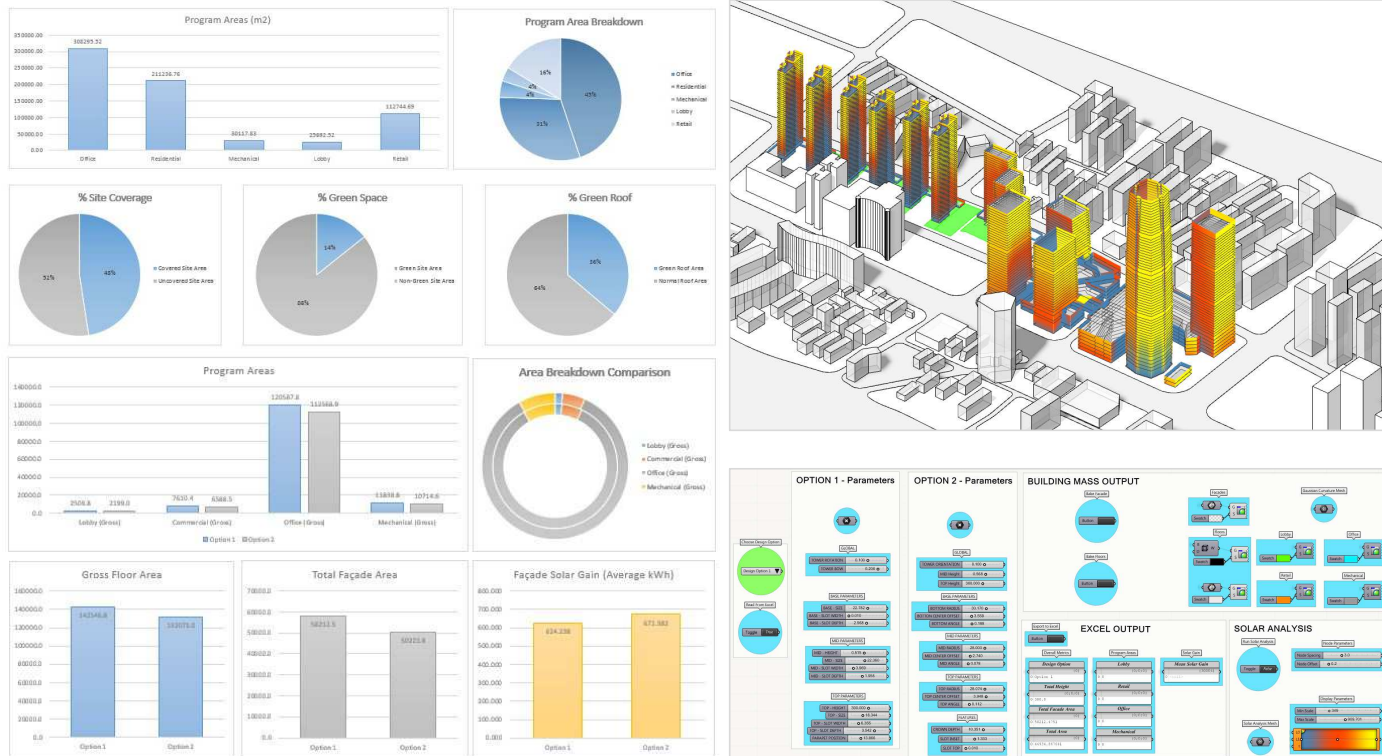
Applications

case

Building Data Management

Design Dashboard

RTKL

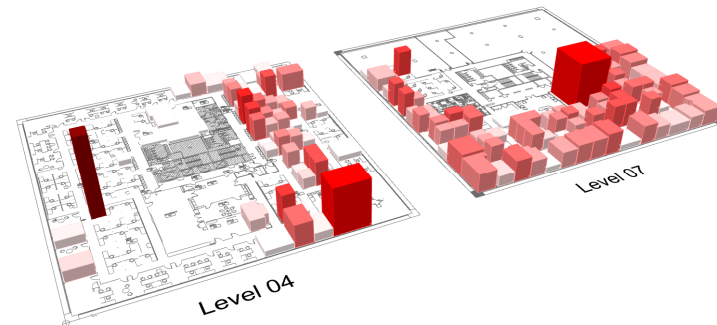
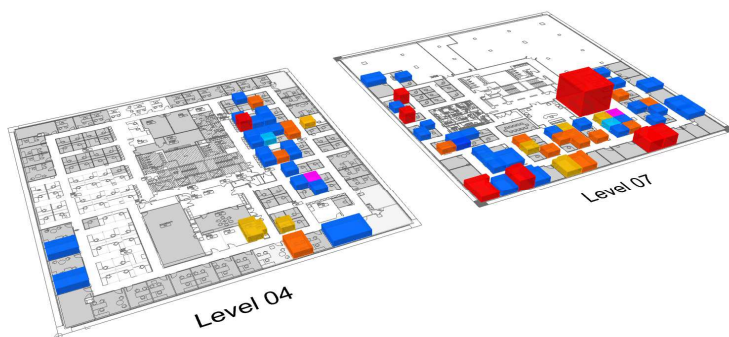


case

Data Visualization

Post Occupancy Data

Plastarc



Level 04



Level 07



Level 04



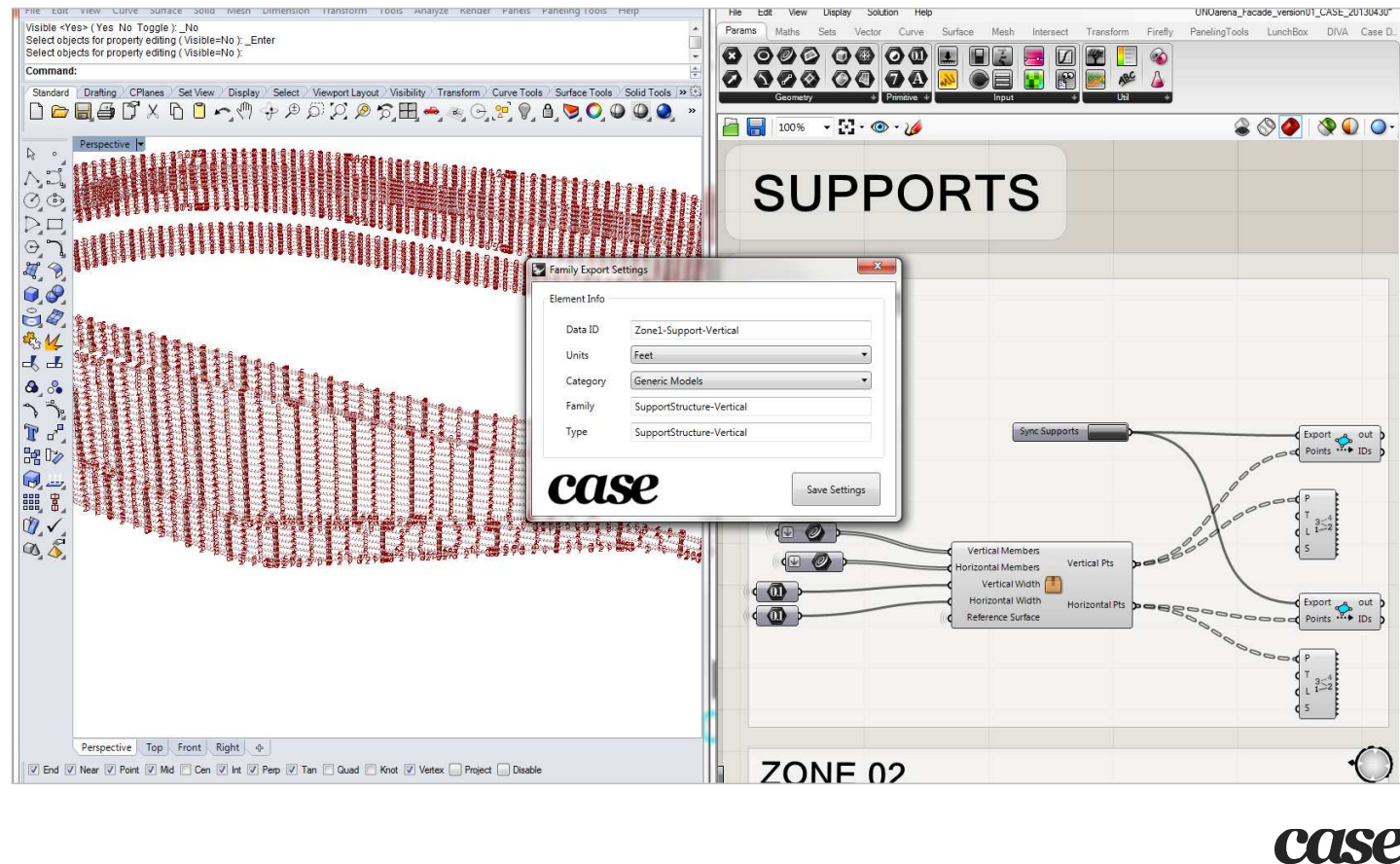
Level 07

case

Interoperability

UNO Community Facility

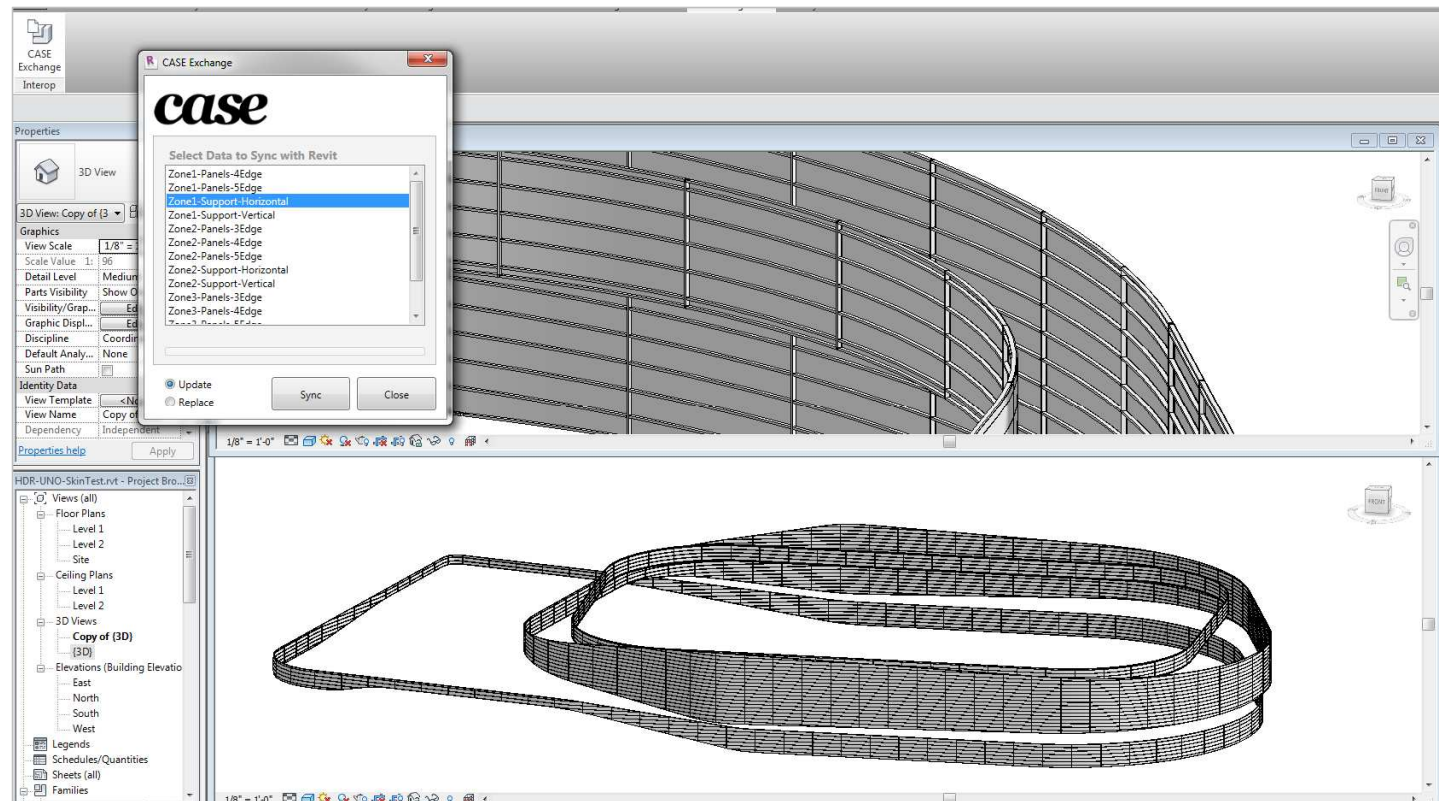
HDR Architecture



Interoperability

UNO Community Facility

HDR Architecture



case

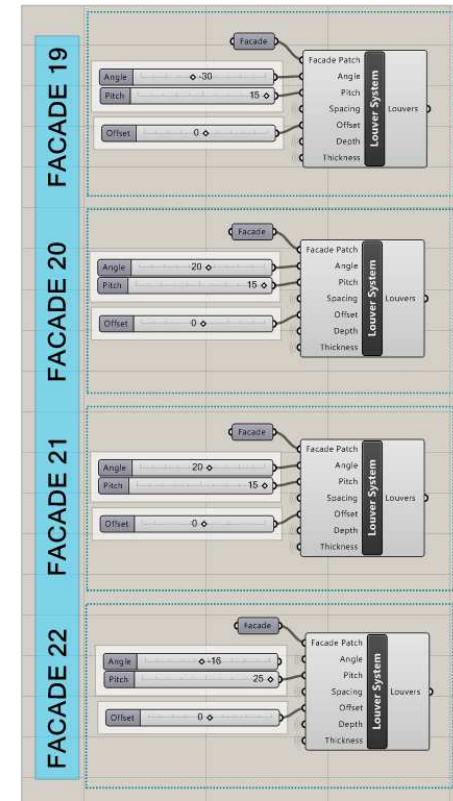
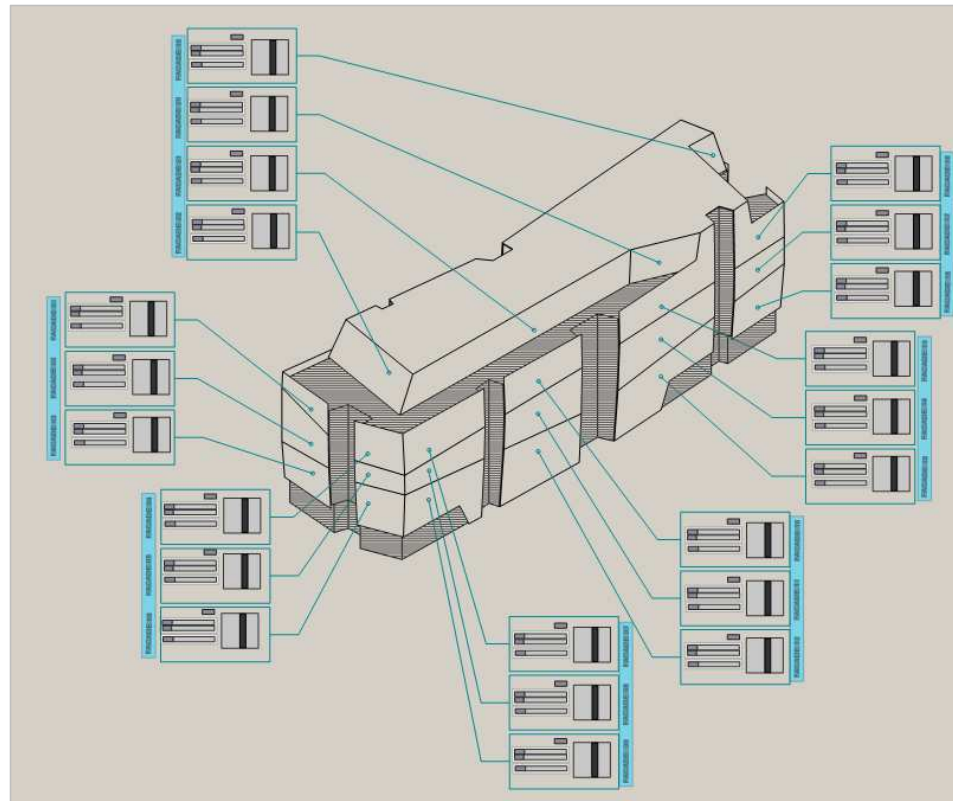
A Short Case Study

case

Parametric Analysis Model

Felleskjøpet Headquarters

SNØHETTA

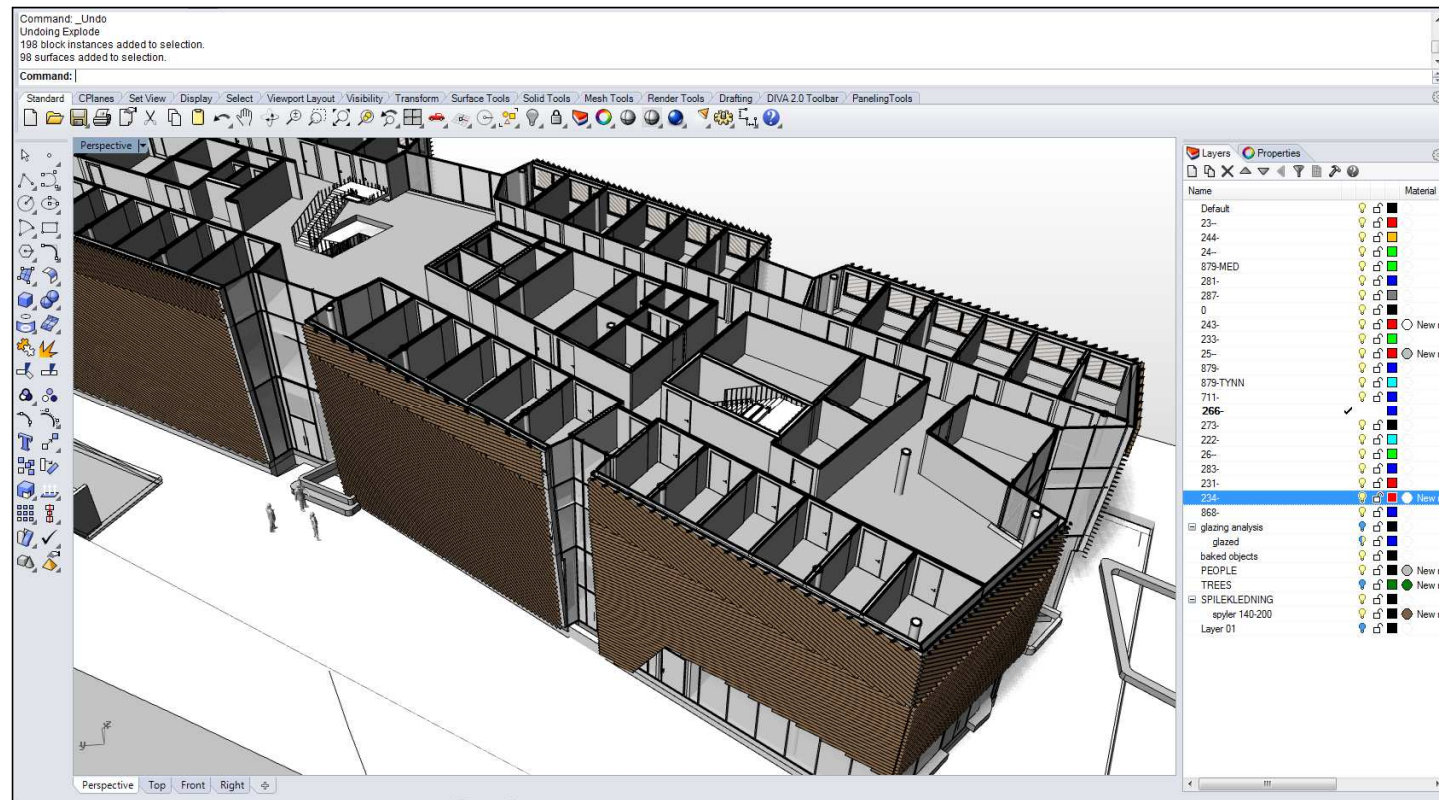


case

Parametric Analysis Model

Felleskjøpet Headquarters

SNØHETTA



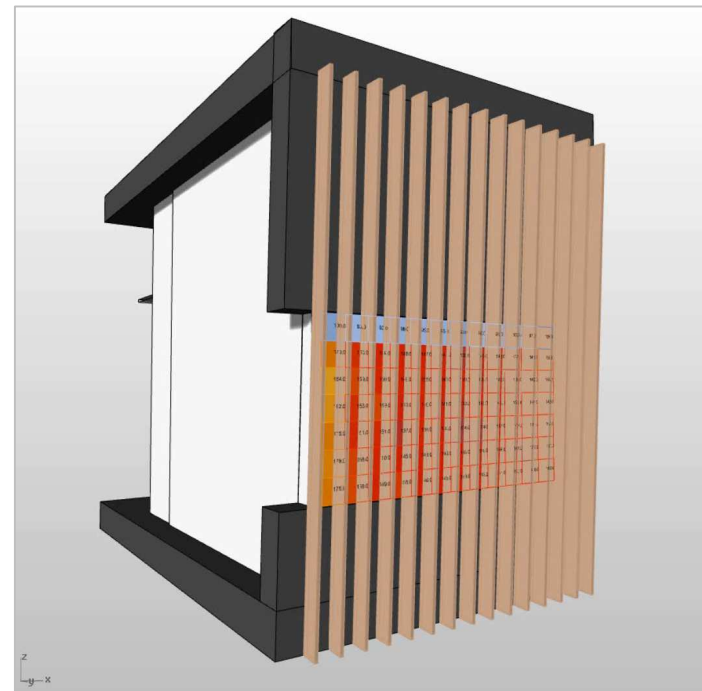
case

Parametric Analysis Model

Felleskjøpet Headquarters

SNØHETTA

	← Louver Angle →		
	% Reduction from Louvers		
	-15	0	15
↑ Louver Rotation ↓	-90	51.125438	51.736603
	-80	47.350376	49.213684
	-70	45.114407	48.460908
	-60	43.131848	49.601252
	-50	43.739286	52.910487
	-40	46.340464	57.207274
	-30	48.639785	60.013416
	-20	49.560259	61.861817
	-10	49.828576	62.435716
	0	49.187598	61.619587
	10	49.0199	60.43825
	20	48.837296	58.634568
	30	48.591339	56.834613
	40	48.896922	55.153909
	50	49.776403	54.12909
	60	49.906835	52.999925
	70	50.327942	51.952747
	80	51.17761	50.823582
	90	53.939033	52.291869

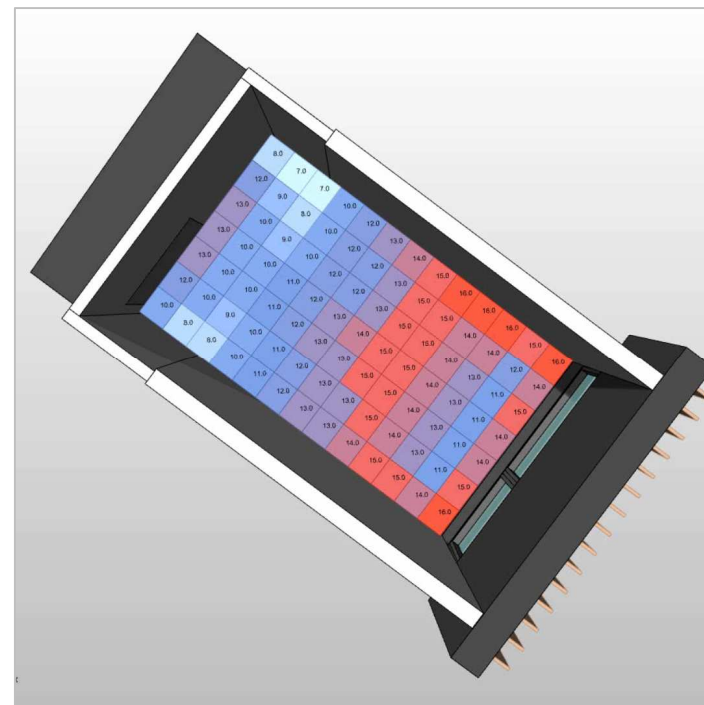
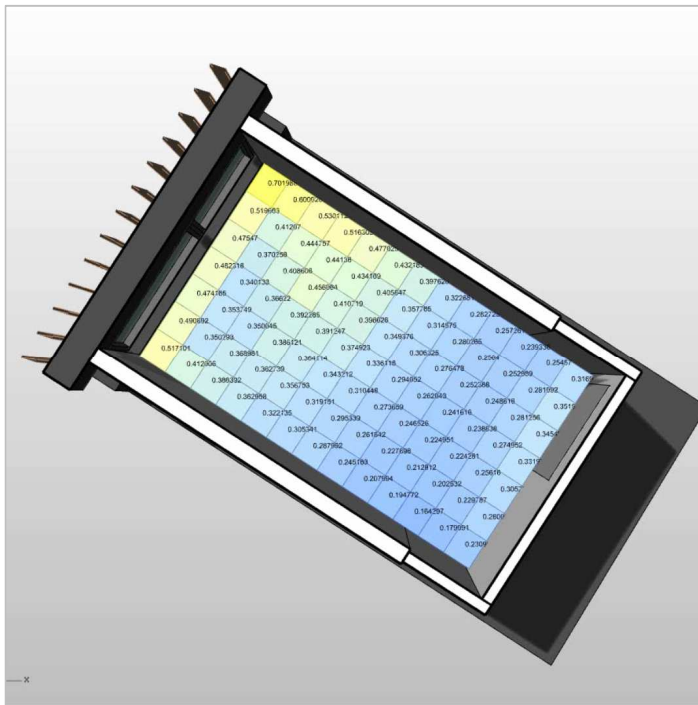


case

Parametric Analysis Model

Felleskjøpet Headquarters

SNØHETTA



case

Parametric Analysis Model

Felleskjøpet Headquarters

SNØHETTA

-15	0	15	-15	0	15
51.125438	51.736603	52.239696	80.4501752	80.6946412	80.8958784
47.350376	49.213684	52.485653	78.9401504	79.6854736	80.9942612
45.114407	48.460908	54.073191	78.0457628	79.3843632	81.6292764
43.131848	49.601252	57.129015	77.2527392	79.8405008	82.851606
43.739286	52.910487	62.476709	77.4957144	81.1641948	84.9906836
46.340464	57.207274	67.574719	78.5361856	82.8829096	87.0298876
48.639785	60.013416	70.932399	79.455914	84.0053664	88.3729596
49.560259	61.861817	72.739808	79.8241036	84.7447268	89.0959232
49.828576	62.435716	73.220541	79.9314304	84.9742864	89.2882164
49.187598	61.619587	74.770813	79.6750392	84.6478348	89.9083252
49.0199	60.43825	71.457852	79.60796	84.1753	88.5831408
48.837296	58.634568	69.199523	79.5349184	83.4538272	87.6798092
48.591339	56.834613	65.856749	79.4365356	82.7338452	86.3426996
48.896922	55.153909	62.987255	79.5587688	82.0615636	85.194902
49.776403	54.12909	60.550048	79.9105612	81.651636	84.2200192
49.906835	52.999925	58.068123	79.962734	81.19997	83.2272492
50.327942	51.952747	55.545204	80.1311768	80.7810988	82.2180816
51.17761	50.823582	53.145263	80.471044	80.3294328	81.2581052
53.939033	52.291869	49.947827	81.5756132	80.9167476	79.9791308

-15	0	-15	-15	0	-15
55.418499	55.705448	56.652009	82.1673996	82.2821792	82.6608036
51.173884	52.89558	56.301707	80.4695536	81.158232	82.5206828
48.814936	51.945293	58.030856	79.5259744	80.7781172	83.2123424
46.400089	53.409853	62.361184	78.5600356	81.3639412	84.9444736
47.32429	57.449504	67.824402	78.929716	82.9798016	87.1297608
50.421108	62.268018	72.769621	80.1684432	84.9072072	89.1078484
52.586271	65.253037	75.948424	81.0345084	86.1012148	90.3793696
53.503019	66.710144	78.035328	81.4012076	86.6840576	91.2141312
53.860774	67.045539	78.65022	81.5443096	86.8182156	91.460088
52.083178	67.902661	80.744578	80.8332712	87.1610644	92.2978312
51.993739	64.5897	76.283819	80.7974956	85.83588	90.5135276
51.993739	62.540061	73.675188	80.7974956	85.0160244	89.4700752
51.501826	60.181114	70.209436	80.6007304	84.0724456	88.0837744
52.150257	58.470597	66.844302	80.8601028	83.3882388	86.7377208
52.888127	57.393605	64.217038	81.1552508	82.957442	85.6868152
53.111724	56.409779	61.258105	81.2446896	82.5639116	84.503242
54.006112	55.261981	59.301632	81.6024448	82.1047924	83.7206528
54.825967	54.88932	57.020944	81.9303868	81.955728	82.8083776
58.325259	56.04457	53.991205	83.3301036	82.417828	81.596482

-15	0	-15	-15	0	-15
51.430823	56.553898	61.719413	80.5723292	82.6215592	84.6877652
52.898024	58.43337	63.61101	81.1592096	83.373348	85.444404
54.068146	59.482236	65.175215	81.6272584	83.7928944	86.070086
53.965078	60.44016	66.521159	81.5860312	84.176064	86.6084636
53.613435	60.561416	67.503335	81.445374	84.2245664	87.001334
52.400873	60.227962	68.109616	80.9603492	84.0911848	87.2438464
51.176185	59.670183	68.418819	80.470474	83.8680732	87.3675276
48.411544	58.645568	68.849279	79.3646176	83.4582272	87.5397116
45.064872	56.632715	68.036862	78.0259488	82.653086	87.2147448
39.12938	52.952589	67.570025	75.651752	81.1810356	87.02801
39.784164	50.436522	62.804656	75.9136656	80.1746088	85.1218624
37.928944	46.853401	58.578877	75.1715776	78.7413604	83.4315508
36.449618	42.433612	52.837395	74.5798472	76.9734448	81.134958
38.886868	39.778101	47.774948	75.5547472	75.9112404	79.1099792
44.634413	41.687887	44.385837	77.8537652	76.6751548	77.7543348
50.630532	46.519947	45.568085	80.2522128	78.6079788	78.227234
54.947254	50.509276	44.247848	81.9789016	80.2037104	79.2991392
58.803201	54.492543	50.491088	83.5212804	81.7970172	80.1964352
61.137383	56.305323	49.95756	84.4549532	82.5221292	79.983024

-15	0	15	-15	0	15
54.813872	60.719049	66.254396	81.9255488	84.2876196	86.5017584
56.456893	61.961926	67.339639	82.5827572	84.7847704	86.9358556
57.281436	62.986541	68.897781	82.9125744	85.1946164	87.5591124
57.560325	63.84746	70.274039	83.02413	85.538984	88.1096156
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41.900085	58.160543	73.675276	76.760034	83.2642172	89.4701104
42.130472	54.207591	67.636716	76.8521888	81.6830364	87.0546864
40.29344	50.303141	62.950164	76.117376	80.1212564	85.1800656
39.40827	45.434704	56.929793	75.763308	78.1738816	82.7719172
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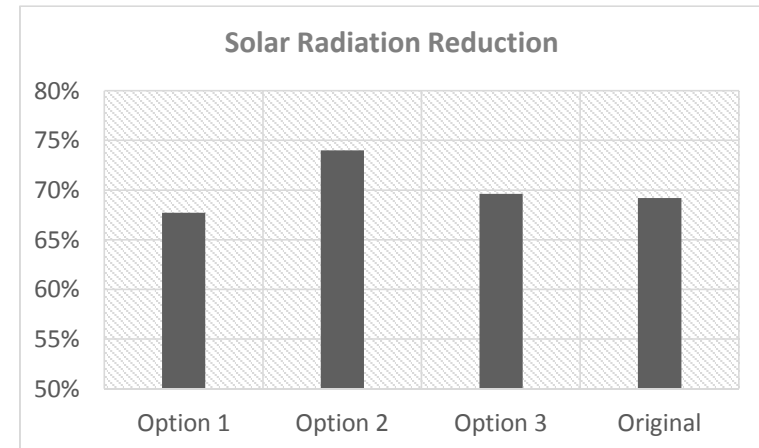
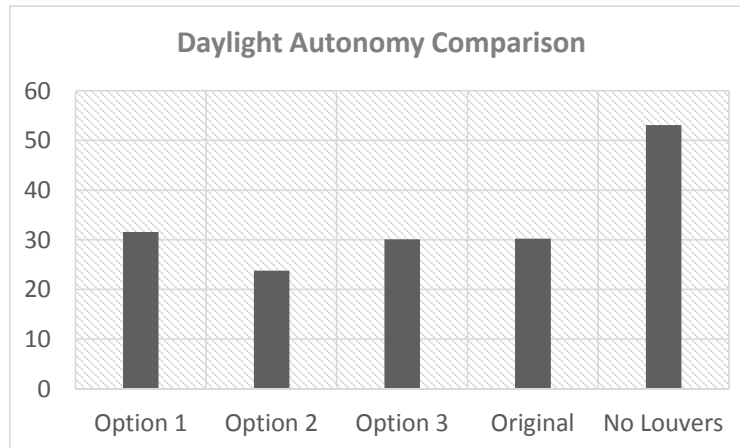
case

Parametric Analysis Model

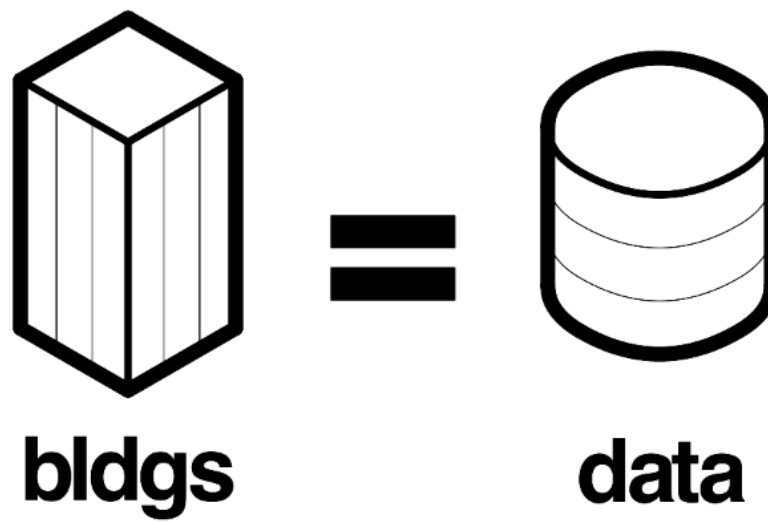
Felleskjøpet Headquarters

SNØHETTA

Parameters			Daylight (Node Averages)				Solar (Node Averages)	
	Depth (mm)	Spacing (mm)	Daylight Autonomy	UDI 100-2000	UDI < 100	UDI > 2000	Radiation (kWh/m2)	% Reduced
Option 1	68	120	31.59340659	53.68131868	41.02197802	4.131868132	77.4	68%
Option 2	92	130	23.8021978	47.96703297	48.10989011	2.769230769	62.35	74%
Option 3	115	170	30.0989011	53.31868132	41.71428571	3.901098901	72.825	70%
Original	140	200	30.27472527	53.26373626	42.01098901	3.758241758	74.37	69%
No Louvers	N/A	N/A	53.12087912	60.13186813	23.24175824	15.41758242	239.925	N/A



case



case