



وزارة الاتصالات والتقانة
MINISTRY OF COMMUNICATION & TECHNOLOGY

CMMI-DEV 2.1

شباط ٢٠٢١





وزارة الاتصالات والتقانة
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محتويات العرض

- مقدمة
- النموذج CMMI
- CMMI & Agile
- دليل الاستحواد Adoption guidance
- الاختبار Appraisal





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مقدمة



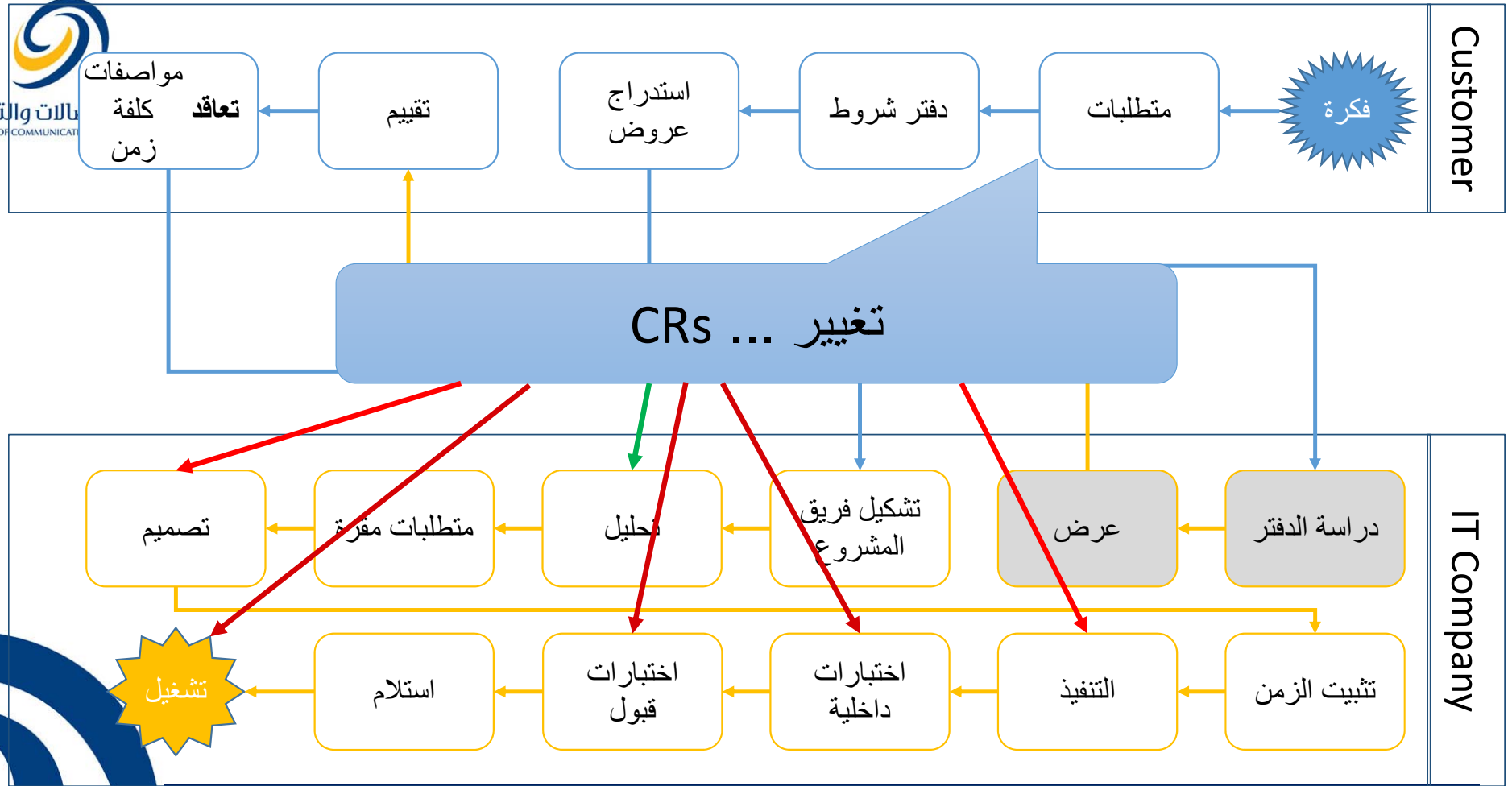
مشاريع تقانة المعلومات

هل مشرونا ناجح



كيف يمكن زيادة احتمال النجاح







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وثائق Work products

نتائج الاختبار	حالات الاختبار	الخطط Plans	التصميم	المتطلبات المقتررة	العقد	دفتر الشروط
Releases	Builds	Audits	Code revisions	Traceability Matrix	Code	سجل الأخطاء
...	CR assess	CR	CR assess	CR	CR assess	CR



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احتاج التنفيذ خمس سنوات بدلاً من واحدة



الزبون لا يعرف ماذا يريد



هذه الوظيفة لا يوجد من ينفذها



حجم التعديلات أكبر من دفتر الشروط



أين اختفت تعديلاتي



لجنة الاستلام تتهرب



هذا الإجراء ليس لهذا الزبون



هل مشروعنا ناجح



■ المواصفات

■ الكلفة

■ الزمن

■ الجودة

الفائدة المتحققة للعمل

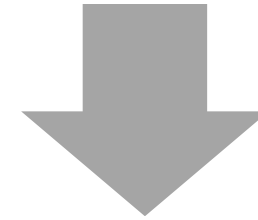
كيف يمكن زيادة احتمال النجاح



ضرورة اعتماد منهجيات مبرهنة
لزيادة احتمال نجاح المشروع



حجم
المشروع



احتمال
النجاح

هل تحتاج شركتنا إلى تطوير الأداء



ما هي المجالات التي تحتاج إلى تطوير



كيف نطور الأداء في هذه المجالات





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CMMI



■ انطلق نموذج CMMI عام ١٩٨٤ لتقييم شركات البرمجيات العاملة مع وزارة الدفاع الأمريكية

■ دراسة آلاف الشركات

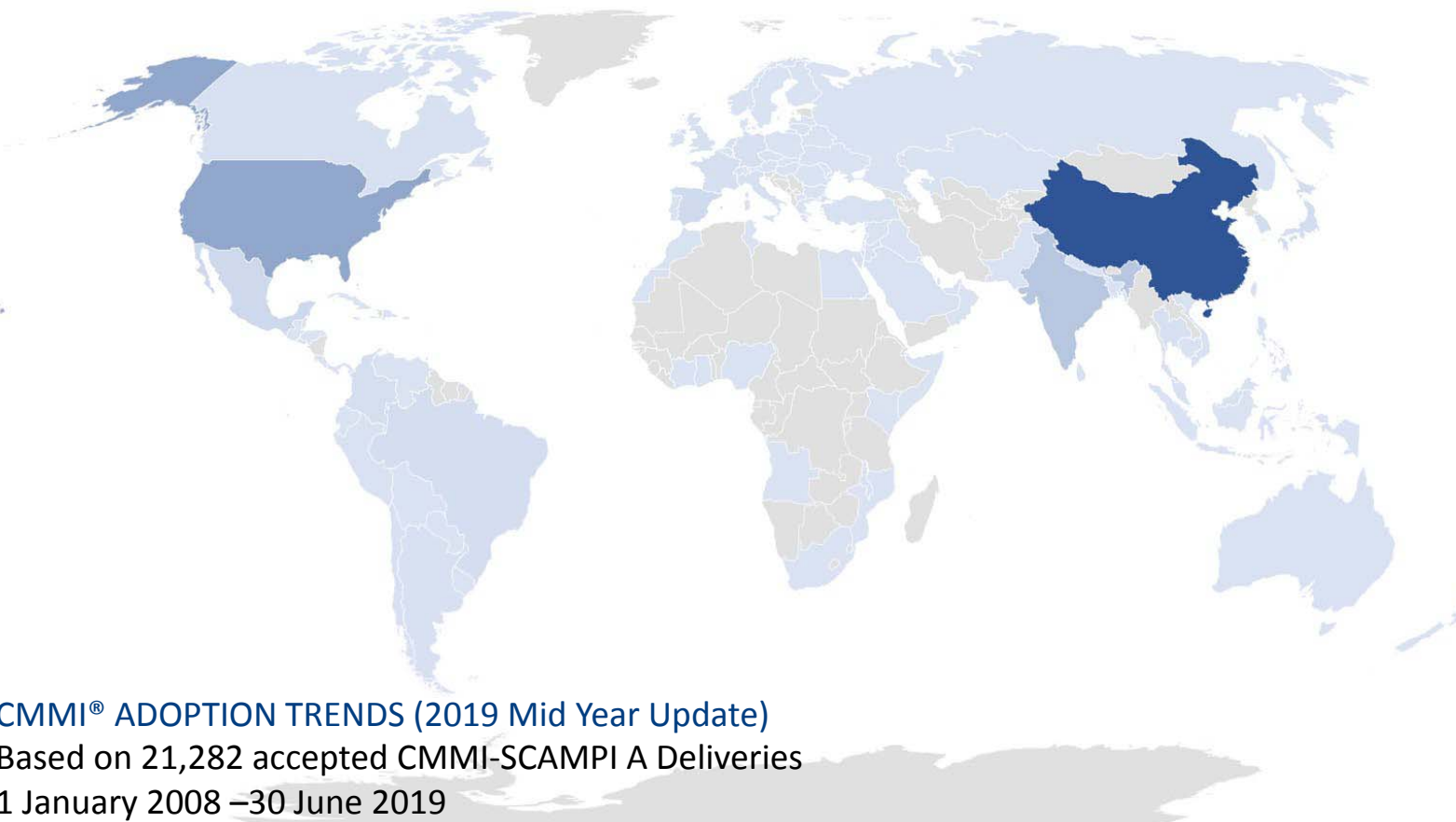
■ اليوم هنالك 9619 شركات مسجلة في الموقع





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Benchmarks in 105 Countries








	Country	#		Country	#
1	China	10341	54	Slovakia	11
2	United States	4392	55	Ecuador	10
3	India	2066	56	Finland	10
4	Mexico	697	57	Latvia	10
5	Spain	579	58	Luxembourg	10
6	Korea	425	59	Austria	8
7	Japan	359	60	Denmark	8
8	Brazil	356	61	Lebanon	8
9	Colombia	297	62	Norway	8
10	France	223	63	Mauritius	6
11	Taiwan	182	64	New Zealand	6
12	United Kingdom	175	65	Sweden	6
13	Germany	160	66	Belarus	5
14	Thailand	159	67	Greece	5
15	Argentina	138	68	Guatemala	5
16	Italy	125	69	Qatar	5
17	Canada	123	70	Brunei	4
18	Chile	118	71	Bulgaria	4
19	Turkey	109	72	El Salvador	4
20	Portugal	90	73	Kenya	4
21	Viet Nam	90	74	Nigeria	4
22	Egypt	87	75	Oman	4
23	Malaysia	84	76	Syria	4
24	Peru	83	77	Tunisia	4
25	Philippines	66	78	Venezuela	4
26	Singapore	45	79	Angola	3
27	Bangladesh	42	80	Cyprus	3
28	Saudi Arabia	42	81	Bahrain	2
29	Pakistan	40	82	Cuba	2
30	Australia	38	83	Dominican	2
31	Morocco	36	84	Iraq	2
32	Netherlands	36	85	Jamaica	2
33	Sri Lanka	33	86	Macedonia	2
34	Belgium	32	87	Nepal	2
35	Hong Kong	32	88	Somalia	2
36	Israel	30	89	Andorra	1
37	Switzerland	29	90	Bolivia	1
38	South Africa	27	91	Cambodia	1
39	Russia	26	92	Comoros	1
40	Poland	25	93	Cote D'Ivoire	1
41	Romania	24	94	Croatia	1
42	UAE	23	95	Ghana	1
43	Uruguay	21	96	Honduras	1
44	Czech Republic	18	97	Kazakhstan	1
45	Hungary	16	98	Lithuania	1
46	Indonesia	15	99	Malawi	1
47	Paraguay	15	100	Malta	1
48	Ukraine	14	101	Moldova	1








CMMI® ADOPTION TRENDS (2019 Mid Year Update)
Based on 21,282 accepted CMMI-SCAMPI A Deliveries
1 January 2008 –30 June 2019

Fortune 500 Organizations by Industry That Use CMMI in One or More Organizational Units

Computer Software

	RANK	COMPANY	REVENUES (\$M)
 Microsoft	28	Microsoft	\$85,320
 ORACLE	81	Oracle	\$37,047
 salesforce	326	salesforce.com	\$8,392
 ACTIVISION BLIZZARD	406	Activision Blizzard	\$6,608
 Adobe	443	Adobe Systems	\$5,854

Computers/Office Equipment











	RANK	COMPANY	REVENUES (\$M)
	3	Apple	\$215,639
 DELL Technologies	41	Dell Technologies	\$64,806
 hp	61	HP	\$48,238
 NCR	409	NCR	\$6,543
 Pitney Bowes	663	Pitney Bowes	\$3,407
 DN	672	Diebold Nixdorf	\$3,341
 SUPERMICR	884	Super Micro Computer	\$2,216

Fortune 500 Organizations by Industry That Use CMMI in One or More Organizational Units

Aerospace and Defense

	RANK	COMPANY		REVENUES (\$M)
	24	Boeing		\$94,571
	50	United Technologies		\$57,244
	56	Lockheed Martin		\$50,658
	90	General Dynamics		\$31,353
	114	Northrop Grumman		\$24,508
	116	Raytheon		\$24,069
	200	Textron		\$13,788
	228	Arconic		\$12,394
	273	L3 Technologies		\$10,597
	380	Huntington Ingalls Industries		\$7,068
	393	Spirit AeroSystems Holdings		\$6,793
	492	Rockwell Collins		\$5,259

Information Technology Services

	RANK	COMPANY		REVENUES (\$M)
	32	IBM		\$79,919
	59	Hewlett Packard Enterprise		\$50,123
	199	CDW		\$13,982
	205	Cognizant Technology Solutions		\$13,487
	379	Computer Sciences		\$7,106
	381	Leidos Holdings		\$7,043
	481	Booz Allen Hamilton Holding		\$5,406



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CMMI

طريقة معيارية لتقييم مقدرات وأداء الشركات
ولتطويرها المتدرج واستدامتها



What



not How



CMMI V2.0 Product Suite





The CMMI Model

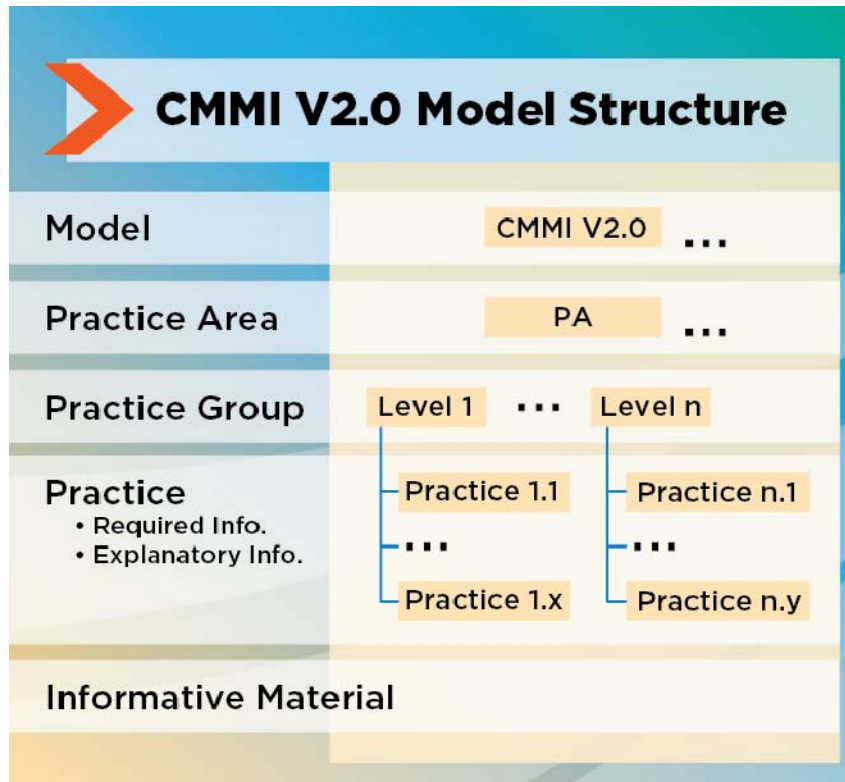
- 1 2000
- 1.1 2002
- 1.2 2006
- 1.3 2010
- 2.0 2018
- 2.1 2020

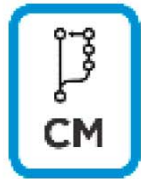


PAAs of CMMI-DEV ML2

Maturity Level 2	1 Requirements Development & Management	RDM
	2 Estimating	EST
	3 Planning	PLAN
	4 Monitor & Control	MC
	5 Process Quality Assurance	PQA
	6 Configuration Management	CM
	7 Managing Performance & Measurement	MPM
	8 Supplier Agreement Management	SAM
	9 Governance	GOV
	10 Implementation Infrastructure	II

The Model Structure





Configuration Management (CM)

PA Overview

Required PA Information

Intent

Manage the integrity of work products using configuration identification, version control, change control, and audits.

Value

Reduces loss of work and increases the ability to deliver the correct version of the solution to the customer.

Additional Required PA Information

This section left blank for future content.



Explanatory PA Information

Practice Summary

Level 1

CM 1.1 Perform version control.

Level 2

CM 2.1 Identify **items** to be placed under configuration management.

CM 2.2 Develop, keep updated, and use a configuration and change management **system**.

CM 2.3 Develop or release **baselines** for internal use or for delivery to the customer.

CM 2.4 Manage **changes** to the items under configuration management.

CM 2.5 Develop, keep updated, and use **records** describing items under configuration management.

CM 2.6 Perform configuration **audits** to maintain the integrity of configuration baselines, changes, and content of the configuration management system.

Additional PA Explanatory Information

Planning for configuration management activities includes controlling work products developed



Capability Levels

■ تحصل الشركة على مستوى مقدرة بالنسبة لمجال أنشطة ما (PA)



Achieve a Capability Level



Maturity Levels

■ تحصل الشركة على مستوى نضوج إذا حصلت على مستوى مقدرة مساوي في كل مجالات الأنشطة المعرفة لمستوى النضوج المقصود

MATURITY LEVEL
5

Optimizing

Stable and flexible. Organization is focused on continuous improvement and is built to pivot and respond to opportunity and change. The organization's stability provides a platform for agility and innovation.

MATURITY LEVEL
4

Quantitatively Managed

Measured and controlled. Organization is data-driven with quantitative performance improvement objectives that are predictable and align to meet the needs of internal and external stakeholders.

MATURITY LEVEL
3

Defined

Proactive, rather than reactive. Organization-wide standards provide guidance across projects, programs and portfolios.

MATURITY LEVEL
2

Managed

Managed on the project level. Projects are planned, performed, measured, and controlled.

MATURITY LEVEL
1

Initial

Unpredictable and reactive. Work gets completed but is often delayed and over budget.

MATURITY LEVEL
0

Incomplete

Ad hoc and unknown. Work may or may not get completed.



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PAs of CMMI DEV ML2 (view)

CMMI DEVELOPMENT WITH SAM VIEW: Level 2 Requirements

Practice Area	Level 1	Level 2	Level 3	Level 4	Level 5
Causal Analysis and Resolution (CAR)					
Decision Analysis and Resolution (DAR)					
Risk and Opportunity Management (RSK)					
Organizational Training (OT)					
Process Management (PCM)					
Process Asset Development (PAD)					
Peer Reviews (PR)					
Verification and Validation (VV)					
Technical Solution (TS)					
Product Integration (PI)					
Managing Performance and Measurement (MPM)					
Supplier Agreement Management (SAM)					
Process Quality Assurance (PQA)					
Configuration Management (CM)					
Monitor and Control (MC)					
Planning (PLAN)					
Estimating (EST)					
Requirements Development and Management (RDM)					
Governance (GOV)					
Implementation Infrastructure (II)					



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CMMI DEV ML3

CMMI DEVELOPMENT WITH SAM VIEW: Level 3 Requirements					
Practice Area	Level 1	Level 2	Level 3	Level 4	Level 5
Causal Analysis and Resolution (CAR)					
Decision Analysis and Resolution (DAR)					
Risk and Opportunity Management (RSK)					
Organizational Training (OT)					
Process Management (PCM)					
Process Asset Development (PAD)					
Peer Reviews (PR)					
Verification and Validation (VV)					
Technical Solution (TS)					
Product Integration (PI)					
Managing Performance and Measurement (MPM)					
Supplier Agreement Management (SAM)					
Process Quality Assurance (PQA)					
Configuration Management (CM)					
Monitor and Control (MC)					
Planning (PLAN)					
Estimating (EST)					
Requirements Development and Management (RDM)					
Governance (GOV)					
Implementation Infrastructure (II)					





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CMMI DEV ML4

CMMI DEVELOPMENT WITH SAM VIEW: Level 4 Requirements

Practice Area	Level 1	Level 2	Level 3	Level 4	Level 5
Causal Analysis and Resolution (CAR)	Red	Red	Red	Red	Grey
Decision Analysis and Resolution (DAR)	Red	Red	Red	Red	Black
Risk and Opportunity Management (RSK)	Red	Red	Red	Red	Black
Organizational Training (OT)	Red	Red	Red	Red	Black
Process Management (PCM)	Red	Red	Red	Red	Black
Process Asset Development (PAD)	Red	Red	Red	Red	Black
Peer Reviews (PR)	Red	Red	Red	Red	Black
Verification and Validation (VV)	Red	Red	Red	Red	Black
Technical Solution (TS)	Red	Red	Red	Red	Black
Product Integration (PI)	Red	Red	Red	Red	Black
Managing Performance and Measurement (MPM)	Red	Red	Red	Red	Grey
Supplier Agreement Management (SAM)	Red	Red	Red	Red	Black
Process Quality Assurance (PQA)	Red	Red	Red	Red	Black
Configuration Management (CM)	Red	Red	Red	Red	Black
Monitor and Control (MC)	Red	Red	Red	Red	Black
Planning (PLAN)	Red	Red	Red	Red	Black
Estimating (EST)	Red	Red	Red	Red	Black
Requirements Development and Management (RDM)	Red	Red	Red	Red	Black
Governance (GOV)	Red	Red	Red	Red	Black
Implementation Infrastructure (II)	Red	Red	Red	Red	Black





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CMMI DEV ML5

CMMI DEVELOPMENT WITH SAM VIEW: Level 5 Requirements

Practice Area	Level 1	Level 2	Level 3	Level 4	Level 5
Causal Analysis and Resolution (CAR)	Green	Green	Green	Green	Green
Decision Analysis and Resolution (DAR)	Green	Green	Green	Black	Black
Risk and Opportunity Management (RSK)	Green	Green	Green	Black	Black
Organizational Training (OT)	Green	Green	Green	Black	Black
Process Management (PCM)	Green	Green	Green	Green	Black
Process Asset Development (PAD)	Green	Green	Green	Black	Black
Peer Reviews (PR)	Green	Green	Green	Black	Black
Verification and Validation (VV)	Green	Green	Green	Black	Black
Technical Solution (TS)	Green	Green	Green	Black	Black
Product Integration (PI)	Green	Green	Green	Black	Black
Managing Performance and Measurement (MPM)	Green	Green	Green	Green	Green
Supplier Agreement Management (SAM)	Green	Green	Green	Green	Black
Process Quality Assurance (PQA)	Green	Green	Green	Black	Black
Configuration Management (CM)	Green	Green	Black	Black	Black
Monitor and Control (MC)	Green	Green	Green	Black	Black
Planning (PLAN)	Green	Green	Green	Green	Black
Estimating (EST)	Green	Green	Green	Black	Black
Requirements Development and Management (RDM)	Green	Green	Green	Black	Black
Governance (GOV)	Green	Green	Green	Green	Black
Implementation Infrastructure (II)	Green	Green	Green	Black	Black





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CMMI & Agile



إعلان أجايل لتطوير البرمجيات

الأفراد وتعاملهم فيما بينهم فوق المنظومات والأدوات
البرمجيات الصالحة للاستعمال فوق التوثيق الكامل
تعاون ومشاركة العميل فوق التفاوض حول العقد
الاستجابة للتغييرات فوق الالتزام بمخطط عمل محدد

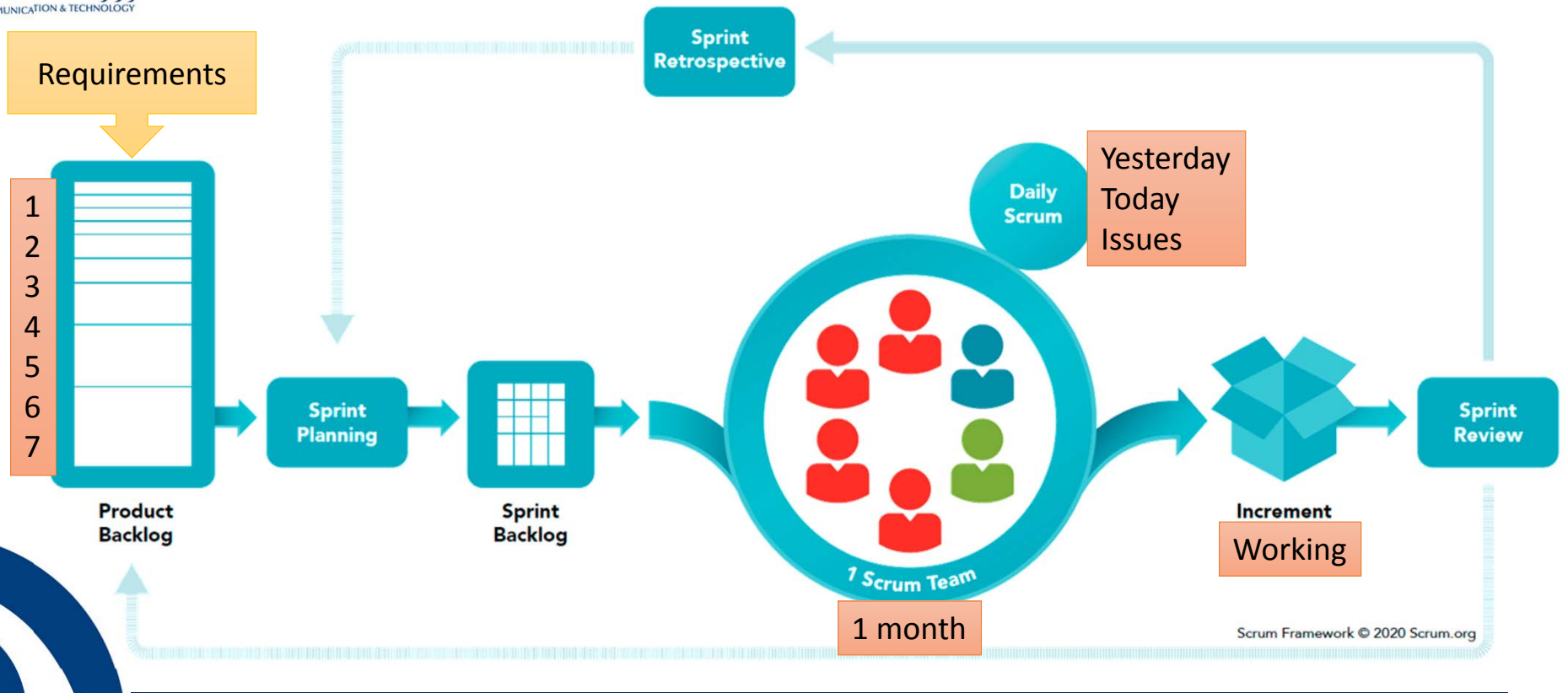
ويعني ذلك أنه على الرغم من كون العناصر على الجانب الأيسر ذات قيمة،
فإننا نعطي قيمة أكبر للعناصر على الجانب الأيمن.

2001

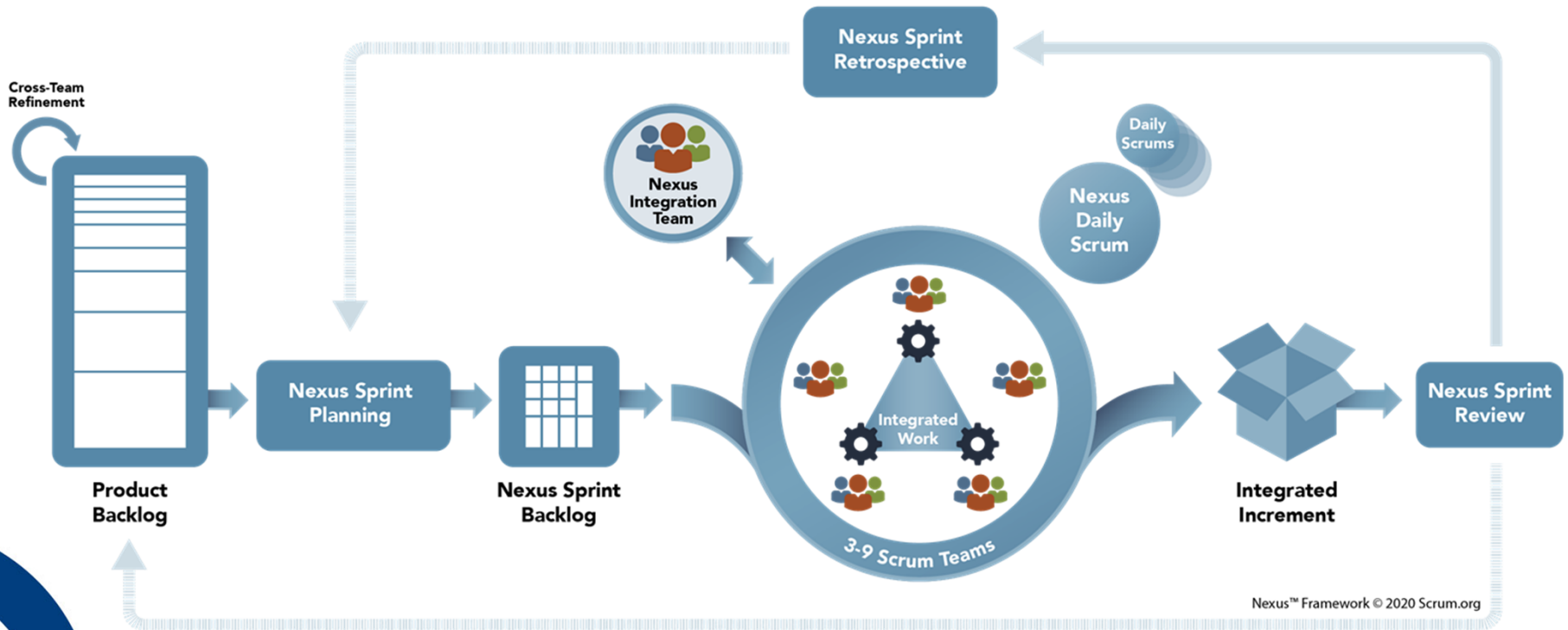


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SCRUM FRAMEWORK



The Nexus Framework





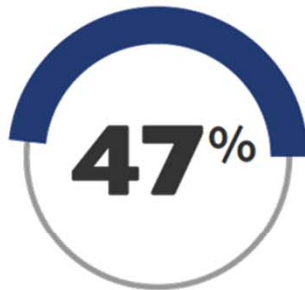
OF TEAMS ARE AT OR BELOW "STILL MATURING" WITH AGILE



OF CORPORATE LEADERS HAVE A PHILOSOPHY THAT CONFLICTS WITH CORE AGILE VALUES



OF IT ORGANIZATIONS HAVE LESS THAN HALF OF THEIR TEAMS PRACTICING AGILE



OF TEAMS LACK EXPERIENCE WITH AGILE METHODS AND TECHNIQUES



OF TECH LEADERS DO NOT HAVE LEADERSHIP SKILLS NEEDED FOR LARGE-SCALE AGILITY



OF TEAMS LACK MANAGEMENT SUPPORT

AGILE IS...

هل نجحنا في تطبيق آجيل



ما أثر تطبيق آجيل على العمل



■ الثقة والتعاون

■ أولوية القيمة للعمل

■ التنظيم الذاتي

CMMI & Agile ... Scrum

■ ٨٠٪ من الشركات المقيمة في السنوات الأخيرة تستخدم Agile

■ Context Specific **Context Tag: Agile with Scrum**

■ النموذج نفسه بنسخته الجديدة أصبح أكثر مرونة وانفتاح

■ يساعد CMMI في توسيع استخدام Agile على مستوى الشركة وفي المشاريع الكبيرة





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Adoption guidance





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Adoption guidance

- دعم كامل ومتابعة من الإدارة
- تركيز جهود التطوير لرفع الأداء
- برنامج عمل فعال وتدرجي ومستمر



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الإدارة Governance

- ممارسات الإدارة العليا لتحسين طرق التنفيذ الهامة للعمل وللشركة
- وضع الاستراتيجيات والتوجهات والتوقعات لتطوير الأداء
- ضمان انسجام الإجراءات مع احتياجات العمل وأهدافه
- مراقبة تطور الأداء والإجراءات
- توفير الموارد المناسبة لتطوير الأداء والإجراءات
- تعزيز وتحفيز تطوير واستخدام الإجراءات لضمان استمرار استخدامها وتحسينها



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البنية التحتية Infrastructure

المطلوبة لبناء واستخدام واستدامة وتطور الإجراءات

■ توصيف الإجراءات

■ الموارد المطلوبة (البشرية، الأدوات، المواد، التسهيلات، الوقت)

■ تمويل تنفيذ الإجراءات

■ التدريب على الإجراءات حسب المسؤوليات

■ تقييم الإجراءات الموضوعي لضمان تنفيذ العمل وفقاً للغايات





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Appraisal



Appraisal

- تحديد نقاط القوة والضعف لدى الشركة ومدى توافق إجراءاتها مع نموذج CMMI
- يسمح بوضع خطة لسد الثغرات، وبنتيجته يتم الحصول على الاعتمادية

Appraisal Type	Ratings	Validity	Most like appraisal in CMMI V1.3
Benchmark	Yes	3 Years	SCAMPI A
Sustainment	Yes	2 Years, if eligible, after a CMMI V2.0 Benchmark	Not Applicable
Action Plan Reappraisal	Same as prior appraisal	Same as prior appraisal	APR
Evaluation	No	Not Applicable	SCAMPI B & C

Highlight the. 2





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Appraisal Results

Published Appraisal Results

Model View:

Any Model View



Country:

Any Country



Target Level:

Any Maturity Level



Year:

Any Year



CLEAR

APPLY



مثال

Organization

Organization Name: SyrianSoft

Organizational Unit: Development Department

Appraisal Sponsor Name: Ali Saad Eddeen

Lead Appraiser Name: Ahmed Abd El Aziz

SEI Partner Name: Software Engineering Competence Center (SECC)

Organizational Unit Description

Projects / Units / Work / Support Groups:

****Sensitive****
Damascus, Damascus Syrian Arab Republic

****Sensitive****
Damascus, Damascus Syrian Arab Republic

****Sensitive****
Damascus, Damascus Syrian Arab Republic

****Sensitive****
Damascus, Damascus Syrian Arab Republic

****Sensitive****
Damascus, Damascus Syrian Arab Republic

****Sensitive****
Damascus, Damascus Syrian Arab Republic

****Sensitive****
Damascus, Damascus Syrian Arab Republic

****Sensitive****
Damascus, Damascus Syrian Arab Republic

EPG Group
Damascus, Damascus Syrian Arab Republic

Training Group
Damascus, Damascus United States

[View Detail](#)

Organizational Sample Size

% of people included: 87

% of projects/units included: 86

Org Scope Description: The organizational scope includes the following six projects:

1. Ameen 8.0 S0S02
2. Ameen 8.0b
3. Joud Manufacturing and Assets
4. Amn8.0-DNF01
5. Amn HR-FG01
6. POSSC

In addition to the following two support groups

1. EPG
2. Training

Appraisal Description

Appraisal End Date: Dec 01, 2011

Appraisal Expiration Date: Dec 01, 2014

Appraisal Method Used: SEI SCAMPI v1.2 A

Model Information: CMMI-DEV v1.3

Functional Areas Included:

Model Scope and Appraisal Ratings

CMMI-DEV v1.3

Level 2	Level 3	Level 4	Level 5
Satisfied REQM	Satisfied RD	Out of Scope OPP	Out of Scope OPM
Satisfied PP	Satisfied TS	Out of Scope QPM	Out of Scope CAR
Satisfied PMC	Satisfied PI		
Not Applicable SAM	Satisfied VER		
Satisfied MA	Satisfied VAL		
Satisfied PPQA	Satisfied OPF		
Satisfied CM	Satisfied OPD		
	Satisfied OT		
	Satisfied IPM		
	Satisfied RSKM		
	Satisfied DAR		

Maturity Level: Maturity Level 3





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شكراً

