for the Improvement of Financial Systems Implementations within the Financial Services Industries

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Abstract The financial industry continues to change, become more global, complex and important to economies all around the work. The industry continues to be in flux and the world financial crisis has resulted in changes that have changed the industry for good. The need for agile, accurate and detailed financial systems has never been so important. This research discusses the issues associated with implementing financial systems within financial services companies, a conceptual framework has been built that will help reduce the risk of implementation failure in future financial systems implementations. Financial experts can use the framework to reduce system implementation risk; help deliver projects on time to budget whilst meet the functionality requirements of stakeholders.

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Keywords Financial information systems · Risk management · Implementation failure · Risk identification

1 Introduction

There are many challenges faced by finance staff implementing systems within financial service firms. Some of these challenges are listed below:

- System failures cause serious issues for finance departments and can be very costly.

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25   • Finance staff is chosen to be involved in systems implementations due to their
26   functional finance expertise and not according to their skill set to implement
27   systems effectively.
28   • Finance systems within financial services tend to be specialized and need
29   extensive input and involvement from financial experts to ensure the system
30   works, this is not always the case so increases the implementation risks.
31   • Simon [1] states that 49 % of implementations have budget overruns, 47 % of
32   implementations have higher maintenance costs and 41 % fail to deliver the
33   expected business value or return on investment.

35   The research study has the objective of creating a framework for reducing the risk
36   of failure of the implementation of financial systems.

2 Literature Review

38   A strong financial services industry is an important factor in ensuring that the
39   economies of the world function efficiently. "Financial systems facilitate the
40   transfer of economic resources from one section of the economy to another" [2].
41   Over recent years we have seen a financial crisis that rocked the world's econo-
42   mies and saw the collapse of some of the industries largest players. Lehman
43   Brothers collapse in 2008 sent shockwaves through the global financial systems
44   industry. We saw emergency consolidations, huge government interventions and
45   nationalization of some banks. The current situation regarding the European
46   banking system is not stable. The financial trilemma indicates that the three
47   objectives of financial stability, cross-border banking and national financial
48   supervision are not compatible [3].
49   Over recent times, the deregulation of 'financial regulation' coupled with the
50   transforming use of information technology transformed the business models
51   banks used by banks. Online banking, on line brokerage services, and more
52   sophisticated products transformed a highly predictable conservative business into
53   a dynamic one. The increased risk of increasingly large sized banks, internation-
54   alization and increased product complexity was made possible through the con-
55   tinuous de-regulation of the industry. The Regale–Neal Act of 1994 reduced the
56   barriers for geographical expansions of firms in the US and allowed interstate
57   banking and The Gramm–Leach–Bliley Act of 1999 expanded the permissible
58   activities of commercial banking as stated by Hendrickson [4]. Both acts led to
59   merger and acquisitions amongst financial institutions and the creation of very
60   large international businesses. The Glass–Seagull Act of 1933 did not allow
61   commercial banking firms to participate in investment banking actives, but the act
62   was repealed partly in 1994 and then the final parts repealed in 1999. The effect of
63   this was to further increase the risk within the industry as people's monetary
64   deposits where then being linked to more risky investment activities. The new

65 truly 'global financial industry' continued to attract the very best talent which then
66 led to advances and more exotic product innovation.

67   Following the recent and on-going financial crisis we have seen governments
68 trying to reverse the de-regulations of previous years; a number of laws have been
69 introduced for example; the US House of Representatives passing the Wall Street
70 Reform Act and Consumer Protection Act of 2009 [4]. The success of the mea-
71 sures governments are taking to try and re-regulate banks is questionable. Despite
72 the huge attention and increased focus on audit, sign-offs and disclosures that
73 accompanied the two acts cited, we are still seeing huge trading issues within
74 leading institutions. Examples include the unauthorized rogue trading at UBS
75 costing the firm $2 billion instantly [5], JP Morgan losing $5 billion via incorrect
76 trading losses [6] and Barclays being fined a record amount of $453 million for the
77 manipulation of LIBOR rates [7].

78   We have seen if an industry is not regulated correctly and at the same time
79 continues to innovate with advances in technology that the successes and benefits
80 of the industry may be out weighted by the problems and costs that can arise. Huge
81 international companies are not easy to audit nor is it simple to get clear trans-
82 parency of their risk positions. In 2012 there have been number of major regu-
83 latory interventions to try to prevent the same type of financial crisis as in 2008.
84 Basel 11/111 will try to ensure that banks are holding enough capital, Wall Street
85 reform and the Consumer Protection Act (Dodd-Frank law) will ban proprietary
86 trading which was one of the main reasons banks become over leveraged and
87 risked their existence [8].

88   So in summary the financial industry is a critical part of our society whose
89 success can be linked directly to our prosperity. The industry's significance has
90 grown since the 1980's and now banks are huge institutions that span the world
91 selling often-complex products that are often difficult to control. The huge
92 amounts of change impacting the industry will have a knock on impact on systems
93 implementations. Ensuring internal projects are successful is one way a bank can
94 help itself in difficult times.

95   Software project failures cost companies millions of dollars each year and often
96 prevent key business objectives from being met. Failure estimates, defined pri-
97 marily by cost and time budgets, overrun as high as 85 % of the original financial
98 target. This is well documented in writings by Jiang [9]. Projects themselves are
99 not just good implementations or bad ones. There are degrees of failure. Failures
100 are too common when implementing financial systems and we will examine the
101 reasons why in more depth.

3 Research Methodology and Data Collection Methods

103 A questionnaire was designed to collect data for this research. The questionnaire
104 was designed for people that have implemented financial systems projects. The
105 questionnaire required respondents to state their type of involvement in the

implementation and to read a set of systems implementation risks and rank risks from 1 to 13 according to its impact on the success of the overall project. Here ordinal scales have been used. Respondents were also asked to give each risk a second rating score according to how well it was executed. This score here is from 1 to 5. The questionnaire asked the respondents to choose the top 3 risks that could have been improved in the implementations they took part on. The questionnaire included open ended questions for respondents to then elaborate on how improvements could be made in these areas.

The final part of the questionnaire asked about the reasons for implementations and asked for overall judgments. The reason for the implementation question was answered by using a very simple nominal scale where there is no relationship or ordering to the numbers used. The questionnaire was administered electronically by email. Respondents were emailed initially to check their email addresses and give their agreement to participate in the research. A pilot questionnaire was constructed and given to 3 respondents to check that the instruction and meaning of the questions was clear. Feedback was given and taken on board on the layout and format of some of the questions.

The primary data collected in this research has been collected using a judgment sampling method. Remenyi et al. [10] acknowledge that judgment samples are inherently subjective but justify the use of judgment samples explaining how "samples are taken where individuals are selected with a specific purpose in mind, such as their likelihood of representing best practice in a particular issue", this means that the sample was essentially non-probabilistic. From the outset it became clear that statistical tests on this type of 'case study' research would have not been possible.

The sample size here was 40. Whilst this may appear to be a small number it does actually represent a large body of knowledge, experience and expertise in a less explored area of research. Respondents work for one of 11 top tier financial institutions, making in effect, a series of small case studies. Some of the banks include Barclays Bank, UBS, Citi Bank, HSBC, Credit Swiss, Lloyds and Bank of America.

The respondents were questioned from many different countries to represent a geographical spread. There is input from 9 countries but importantly, the key financial hubs around the world have been incorporated. These include London UK, Hong Kong, Singapore, New York US and Zurich Switzerland.

The research was split into 2 key aspects.

- A ranking of the risk categories to establish which is the most important to a successful implementation
- A rating to show which risks are normally well executed and which ones are not.

These aspects need to be analyzed to build the framework needed to help improve the success of future systems implementations in financial service industries.

148 The data was analyzed and presented by:

149 1. **By importance ranking**—risk factors were ranked in order of importance by
150   respondents. An average was calculated and the results re-ordered and tabu-
151   lated. The lower the number the more important the risk factor to an
152   implementation.
153 2. **By execution rating**—an average was calculated for respondents' scores for
154   execution. Each factor was averaged in turn. The higher the number the worse
155   that factor was executed.
156 3. **A focus factor was calculated**—The importance ranking data and the execu-
157   tion rating data were combined to create a focus factor. The two data sets were
158   added together and averaged. The focus factor illustrates the combined
159   importance of that factor overall. Some factors are very important and executed
160   well. Some less important factors were executed very badly. The combined
161   position helps the project teams to understand the importance of the combined
162   picture.

163 A framework for reducing implementation failure was created. The proposed
164 framework uses the importance ranking, execution rating and focus factor results.
165 Data from the questionnaires were combined to create the overall framework, pre-
166 readiness assessment and during the project risk assessments. The framework was
167 reviewed with two post project reviews in order to assess the usefulness of the
168 framework.

169 # 4 Data Presentation and Discussion

170 When questioned about the success of software project implementations; 28 % of
171 responses stated that the project went really well and improved the department.
172 31 % stated that the project went well but the capability wasn't really improved.
173 23 % stated that the project was ok but not worth the investment. In this case the
174 respondents would not have started or commissioned the project if they had known
175 the outcome. The most worrying scores where the next two categories. 10 % stated
176 that the project was really poor and actually moved the department backwards.
177 This was due to less functionality, poor reporting and poor processes. 8 % stated
178 that the project was a complete disaster. All respondents were allowed to state the
179 main reasons for issues with the implementations and the majority of responses
180 state that a lack of resources and funding issues resulted in a compromise in the
181 systems execution capability. Poor training or rushed user acceptance testing was
182 also noted.
183   When asked to state the key things that went wrong the majority of answers fell
184 into the following 6 categories:

185 1. **Scope Creep**—Project scope kept moving causing re-work, budget issues and
186   productivity loss

2. **Budgets**—Budgets are always tight but due to issues with financial markets budgets are often cut. Scope creep without budget increase can cause lack of delivery
3. **Lack of engagement**—Poor communications resulted in the majority of the team feeling completely disengaged
4. **Poor Requirements**—The project delivered the requirements, but the requirements were incorrect and therefore the project was deemed to have failed
5. **Training**—Lack of UAT or user BAU training results in lack of adoption or resistance
6. **Leaders**—Leaders not resolving issues when problems happen. Conflict resolution or resources allocation then become issues that could then go off track and de-rail the implementation.

An analysis that examines the factors that make a system successful or not was conducted by using a questionnaire. Financial experts ranked 13 factors in order to show the most important and least importance factor in making a project implementation successful overall. This data was then split and cut into sets according to the level of use, knowledge or expertise etc. For example subject matter expert responses can be compared to the responses of people leading the project. This would be useful for example to compare the level of contributions from different roles and grades of staff within the company.
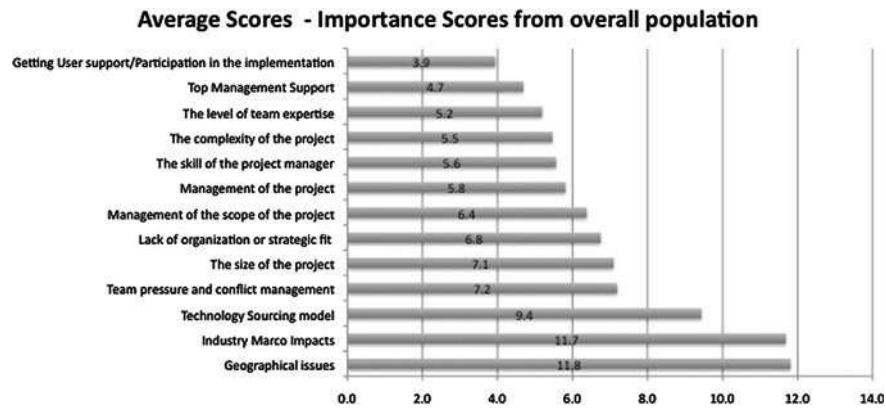
The success of each individual factor within an implementation has been assessed along with how well it was actually executed. So overall importance and execution can be compared.

Figure 1 has been constructed by looking at the overall rankings submitted by the respondents. The results have been generated by adding together and then averaging the ranking ratings. For example for user participation, the sum of the ranking scores is 126 as some respondents ranked it 1st and some ranked it 10th. On average people ranked it 3.9 out of 13 but this score made it the most important out of all the factors after all the factors had been added together and averaged one by one. Top management support's overall score was 150 giving an average score of 4.7.

AQ2

This next section looks at the execution of each factor. This does not take into account ranking but purely whether the factor was executed well or not. Respondents rated their experience with each factor from 1 (very negative) to 5 (very positive). Scores were then added together and an average was calculated. Essentially the lower the score the least successful that factor was implemented, the higher the score the better that factor was implemented. The results can be seen in Fig. 2. A similar approach has been used with this data; the overall position of the factor has been calculated and then the data has been further organized according to role, use level etc.

Figure 2 shows that the execution factor ranking is very different to the importance ranking discussed earlier. The lowest scores (therefore showing the least effectively executed factor) are team pressure and conflict management

Fig. 1 Importance ranking

Fig. 2 Execution ranking

followed by management of scope, complexity and size of the project. The most successfully executed factors were top management support, team expertise and getting participation from users during the implementation. The latter set of factors were all ranked as the most important factors in the previous discussion.

The execution and importance were combined to create a joint list of important and focus for execution. By combining the two rankings and highlighting the learning points, there is the potential to reduce the negative responses, the like of which has been documented in the table below. This combined ranking puts a different emphasis on what needs to be focused on (Table 1).

AQ3

Table 1 Areas of focus

Average of combined ranking				Total
Factors	Ranking overall	Ranking 1 and 2	Combined score	
Top management support	2	3	5	1
The complexity of the protect	4	4	8	2
Management of the scope of the project	7	2	9	3
Team pressure and conflict management	10	1	11	4
The level of team expertise	3	8	11	4
Getting user support/participation in the implementation	1	11	12	6
The skill of the project manager	5	8	13	6
The Size of the project	9	4	13	8
Lack of organization or strategic fit	8	6	14	10
Management of the project	6	12	18	11
Industry macro impacts	12	6	18	11
Technology Sourcing model	11	8	19	12
Geographical issues	13	13	26	13

5 Conceptual Framework

From the outset, this research set out to create a user friendly tool that could be used by professionals to better implement financial systems. Current research into the area and primary data has been combined to present a set of documents that can be used with finance teams to improve system implementations.

The framework was constructed using:

1. The importance ranking insight gained from the research
2. The execution rating insight gained from the research
3. The combined focus factor insight gained from the research

The overall framework is documented in Table 2 and starts with the main categories that cause project failures; top management support, scope change management and user participation are all examples here. The framework then explains the main risks and implications of not mitigating the risk. This is to help inform the project team of issues with system implementations. The framework then recommends the actions that need to be completed before and during a project. The use of the framework will not guarantee the success of a system implementation project but will help ensure a project is prepared, learns from basic errors other projects have made and self monitors its own progress.

AQ4

Table 2 The conceptual framework

General focus areas	Implications and risk mitigating	Actions before you start	Actions during project
Pre-training and readiness training *Stakeholders/Responsible*: Project Leaders/ Subject Matter Experts/Users	It's important that everyone understands why projects go wrong, how to ensure they stay on track and the risks involved	(1) Project sponsor completes training and reviews readiness assessment (2) Subject matter experts and project leader complete delivery and mitigation training (3) A project delivery readiness assessment is completed	Project implementation progress assessment to be completed
Top Management Support *Responsible*: Project Leaders	People want to ensure that senior management support system implementation	(1) Ensure senior management support. Senior management complete the implementation training (2) Ensure there is public recognition of the support of the project (3) Send out communications from Exec sponsor and project lead (4) Ensure top management allocates the correct human and financial resources to make the project a success. Ensure the scope, financial budget and resources are matched together	(1) For large project implementations continuous communications of support will be required by Senior Management (2) Active participation in steering committees to ensure issues are understood and dealt with quickly (3) Scope changes are to be assessed before changes are made
Application Complexity *Responsible*: Subject Matter Experts/Users	Systems are often over complicated, don't use industry standards, don't reuse existing internal software and overly customized	(1) Plan to use standard functionality unless this is impossible (2) Complete a full buying vs build your own assessment before design is completed (3) Assess existing software to see if anything can be reused (4) Ensure there is a plan for updating the system in the future	(1) Document the system development to help reduce time to resolve issues and to help hand over the software to run

(continued)

Table 2 (continued)

General focus areas	Implications and risk mitigating	Actions before you start	Actions during project
Scope Change Control	Scope creep can have a disproportionate impact on productivity, cost, morale and results in projects not delivering	(1) Ensure the requirements are signed off agreeing the scope of the project (2) Ensure the sponsor, project lead, project team and users understand what success looks like (3) Ensure there is a clear and communicated process to handle scope changes	(1) Ensure detailed design is again signed off and then delivered (2) Impact assessments of any change need to be signed off by senior stakeholders. Additional funding need to be secured before any project plans are changed
Responsible: Stakeholders/Project Leaders/Subject Matter Experts			
Team Expertise	Without a team that can work together, with the right expertise then project will fail	(1) Get people with the skill and motivation to deliver a change project. The team needs technical and change management skills (2) The leader needs to be able to communicate with all stakeholders and sell the system. The leader needs the ability to say no	(1) Make a team effectiveness assessment to ensure we are getting the best from the team (2) Replace ineffective team members quickly (3) Risks are continuously assessed to ensure the project is delivered (4) Ensure there is an independent review and input regarding project progress
Responsible: Project Leaders			
Team Pressure and Conflict Management	Conflict needs to be managed carefully or fairly. These will arise so swift resolution is needed for sake of the project	(1) There needs to be a process of raising concerns in an open way to enable resolution (2) Detailed milestone plan, scope, budget and resources will be agreed upon before green light (3) Senior management need to foster open and honest discussions	(1) Complete detailed project reviews and ensure that the team agrees and signs up to schedule (2) Steering Committee will assess the progress of the project and ensure corrective action is made (3) Milestones deliverables will be assessed against original plan (4) Ensure there is an independent review and input regarding project progress
Responsible: Project Leaders/Subject Matter Experts			

(continued)

Table 2 (continued)

General focus areas	Implications and risk mitigating	Actions before you start	Actions during project
User participation *Responsible*: Project Leaders	It is the users who will make the development work as they ensure the system works when it goes live. Active participation in making this happen is the only way to achieve results	(1) Lock in key personnel participation who are able to deliver this project (2) Spend time completing team building activities to ensure personality team dynamics are understood (3) Ensure subject matter experts sign-off requirements and UAT (4) Create a shared charter explaining how the project, risk management, communications and issues should be managed. Ensure all sign-off to it (5) End user training, UAT testing and continuous consultation needs to be at the heart of the program	(1) It is key to ensure the users have enough time to test and train on the system (2) Documentation of current processes and the new system process documentation are completed (3) Ensure the project team listens and understands the real issues and doesn't get completely absorbed by tasks (4) Test scripts are completed by the teams who will use the system going forward
Project Manager *Responsible*: Subject Matter Experts	A quality project manager is worth every penny. They have done this before, been successful and know what it takes do deliver	Lock in a project manager who knows how to project manage and has experience delivering the size of project required. If large project then you need a project manager who has completed projects before, understands planning, risk management, outstanding communication skills and strong budgeting skill. Ensure that the project manager has the technical understanding of what is required	Ensure the project manager has the authority to deliver the project

(continued)

Table 2 (continued)

General focus areas	Implications and risk mitigating	Actions before you start	Actions during project
Project size *Responsible*: Project Managers	Large projects are more complicated and this increases the risk. It's important that the project size is managed through development techniques and reduces risk	(1) Ensure roles and responsibilities are clear across the sponsor, project team and users (2) Break the project down into phased completions – Helps progress and de-risks the project (3) Bundle developments into releases, plan these in and communicate the future releases	Develop prototypes of components and get buyin before all development has been completed
Organization Fit *Responsible*: Stakeholders	A project that is not strategic is by nature tactical or regulatory	(1) Assessment against the end state architecture (2) Ensure you're clear on why the project is being completed – Technical/Strategic/ Regulatory – Short/Long Term Legacy – Replace/Enhancement (3) Ensure the benefits of the project are clear, calculated and communicated	Continue to explain the need and reason for the project compared to the strategic need of the business
Industry Macro Impacts *Responsible*: Stakeholders Management of the project	The industry is going through huge levels of change and this means short term changing priorities, constrained budgets and distracted leaders/employees	(1) Ensure that the last change in the industry will not impact the project (2) Ensure that there is a process to continue to gain on sponsor support	Ensure people keep focused on the future, the project and the reasons the project is being completed. Change will continue to happen so focus on deliverable and reducing the
Responsible: Subject Matter Experts	It's important that plans are kept up to date, expectations are managed and issues raised to senior stakeholders quickly	(1) Complete a project plan that is realistic and has contingency with the plan (2) Ensure that the project plans covers a warranty period when the project goes live (3) Ensure that the project uses SDLC or any other structured implementation methodology	(1) Continue to replan and ensure activities are on track or manage expectations early (2) Communication and participation needs to be high to deliver the project (3) Selling the project and ensuring others really understand the progress is as important as the deliverable itself

(continued)

Table 2 (continued)

General focus areas	Implications and risk mitigating	Actions before you start	Actions during project
Technology	It's important that complex project vendors delivering part of the project need to be coordinated carefully	(1) Understand how we can de-risk the project by using fix price bundles of work	Continuously ensure that the vendors are delivering to the schedules they have committed to as part of the overall plan
Sourcing Model		(2) Complete a full assessment of buying products vs build in-house	
Responsible: Project Managers			
Geographical Concerns	Communication, training and co-ordination are difficult issues during complex projects. These are made harder due to time zone differences, and cultural differences	(1) Need a plan to ensure we keep distance locations up to date with progress	Appreciate and accommodate different time zones and spend the time to engage and motivate more remote locations
Responsible: Project Managers		(2) Ensure there is a plan in place to gain participation, engagement, testing, training and support from more remote locations	

6 Conclusions

The financial services industry is going through unprecedented levels of change. Due to the near banking collapse of 2008, banks have reduced earnings; they have greater levels of regulation, and are required to hold greater levels of capital. Leaders who are trying to manage these changes within institutions can lose focus on implementation projects. System implementations continue to be problematic, not delivering the functionality and benefits the projects promised from the outset. With reduced investment funds and distracted leaders a framework to reduce risk that is easy to use and effective will help projects deliver more. Easy to use tools to help educate leaders, subject matter experts and project leaders are needed. It is clear that issues are commonly repeated across organizations and basic to complex mistakes are continuously made. Although tools will help, it is important to note that system implementations are linked to people. People are the key factor in making it work: from senior leadership sponsorship to the expertise of project managers, from experts participating in development and the end users who will use the system, all play a role. It is important to understand that system implementations are huge change projects. Change projects impact people and while people remain flawed with agendas, then projects will continue to fail. The framework produced here is therefore people focused, helping people deliver better systems, de-risking the human role in system implementations.

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